DNX Series
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DNX
Digital Network Exchange Series

Installation and Operation Manual

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FCC Information

This equipment complies with the requirements in Part 15 of FCC Rules for a Class A computing device. Operation of this equipment in a residential area may cause unacceptable interference to radio and television reception, requiring the operator to take whatever steps are necessary to correct the interference. Eastern Research shielded cables should be used with this unit to ensure compliance with the Class A limits.

This equipment meets the technical criteria specified in the Part 68 rules, sub-part A through F, (for connection of terminal equipment to the telephone network) as well as the requirements specified in AT&T Technical Publications 62411, 54016 and 54019A (ESF).

This equipment meets the safety requirements of the Underwriters' Laboratories (UL) technical publications UL 1950, Third Edition.

FCC User Requirements

THE FOLLOWING INSTRUCTIONS APPLY SPECIFICALLY TO THE *QUAD T-1 MODULE*

This information is provided to ensure that you comply with the Federal Communications Commission (FCC) Rules, Part 68:

1. All direct connections to the T1 digital lines must be made through standard plugs and jacks furnished by the telephone company. No connections can be made to party lines or coin lines. Before connecting your unit, you must do the following:
   a.) Tell your local telephone company that you have an FCC registered device that you wish to connect to the company's lines. Provide the fourteen-digit FCC registration number listed on the label. The telephone company will also need to know the facility interface code (04DU9-B) and service code (6.0N) in order to connect the necessary service.
   b.) Inform the telephone company that you wish to use the RJ48C jack arrangement.
   c.) After the telephone company has installed the RJ48C jack, you may connect the CSU with the appropriate cable.
2. If the unit appears to be malfunctioning, it should be disconnected from the telephone line until the source of the problem is confirmed. If the unit needs repair, it should not be reconnected until after the repair is completed.
3. The CSU has been designed to prevent harm to the DDS or T1 network. If the telephone company determines that it is exceeding tolerance parameters, they are permitted to temporarily disconnect service. When possible, the customer will be given advance notice.
4. Under FCC Rules, no customer is authorized to repair the equipment, regardless of its warranty status.
5. If the telephone company alters the equipment in a manner that will affect its usage, advance notice must be given to prevent service interruption.

Normally, Eastern Research CSU equipment will be used to interface either FCC registered or grandfathered digital terminal equipment to the digital service channel. If the equipment to be connected is not of this type, institutional procedures provide that an affidavit be supplied to the telephone company. This affidavit must state that the system will be operated only by trained individuals and that the signal power at the telephone company interface will not exceed the limits set forth in Part 68 of the FCC's Rules and Regulations.

THE FOLLOWING INSTRUCTIONS APPLY SPECIFICALLY TO THE *OCTAL T-1/E1 MODULE*

This information is provided to ensure that you comply with the Federal Communications Commission (FCC) Rules, Part 68: To meet EMI and RFI regulations, a shielded twisted pair cable must be used. The drain wire must be attached to one of the two ground lugs available on the rear bezel. The drain wire connection must be kept as short as possible. In addition, the rear card must be secured to the chassis by means of firmly tightening the card and securing screws on the bezel.

Industry Canada

NOTICE: The Industry Canada label identifies certified equipment. This certification means that the equipment meets certain telecommunications network protective, operational and safety requirements. The Department does not guarantee that the equipment will operate to the user's satisfaction.

Before installing this equipment, users should ensure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. In some cases, the company's inside wiring associated with a single line individual service may be extended by means of a certified connector assembly (telephone extension cord). The customer should be aware that compliance with the above conditions may not prevent degradation of service in some situations.

Repairs to certified equipment should be made by an authorized Canadian maintenance facility designated by the supplier. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment.

Users should ensure for their own protection that the electrical ground connections of the power utility, telephone lines and internal metallic water pipe system, if present, are connected together. This precaution may be particularly important in rural areas.

CAUTION: Users should not attempt to make such connections themselves, but should contact the appropriate electric inspection authority, or electrician, as appropriate.

The Load Number (LN) assigned to each terminal device denotes the percentage of the total load to be connected to a telephone loop which is used by the device, to prevent overloading. The termination on a loop may consist of any combination of devices subject only to the requirement that the total of the Load Numbers of all the devices does not exceed 100.

1 Overview

The Eastern Research Digital Network Exchange Series (DNX) is designed specifically for the ever present changes that take place in the LAN and WAN domain. The DNX allows both circuit- switched and packet-oriented traffic to share the same platform for access to the wide area trunks. Circuit switching, packet switching, data compression and routing functions are combined under one platform. The DNX optimizes today's LANs and central office digital services while positioning you for the future with new devices, new interfaces, and new technologies.

COMPONENTS

The standard components of the DNX system include equipment chassis, load-sharing power modules, system manager card, and application modules.

CONFIGURATIONS

There are two types of equipment chassis, the DNX-4 and the DNX-11. All of the application modules are interchangeable between the two chassis.

- **DNX-11:** The DNX-11 is the larger of the two chassis, supporting 11 application modules. It is designed for large, more sophisticated central site applications. It comes standard with one System Manager (DNX02350) which controls all programming options and one Power Supply Module (DNX01101) which drives the system. It accommodates up to eleven application modules and eleven interface modules. The DNX-11 allows for an optional redundant System Manager Module and an optional Power Supply Module.

  The eleven application module slots allow for the insertion of up to 11 combinations of application modules. In its most simplistic configuration, the DNX-11 can be used as a 44-port T1 DACS or several channel banks within one chassis.

- **DNX-4:** The DNX-4 is the tabletop four-slot version of the DNX chassis. It is designed as a cost-effective solution for small or remote applications. It comes standard with one System Manager (DNX02350) which controls all programming options and one Power Supply Module (DNX01101) which drives the system. The DNX-4 accommodates up to four application modules and four interface modules and allows for an optional redundant System Manager.

  The four application module slots allow for the insertion of up to 4 combinations of application modules. The Quad T1 modules enable the DNX-4 to be used as a 16-port DACS. Various combinations of data and T1 trunk cards can suit the requirements of many network applications.

DNX System Manager (DNX02350)

All of the application modules in the DNX chassis are under the control of the DNX System Managers. The System Manager module, and optional redundant System Manager, occupy a pair of half-height card slots. The application modules are controlled via a pair of communication busses on the DNX mid-plane. These dual busses increase the reliability of system management by giving the managers two paths for controlling the modules in the DNX chassis.

The System Manager module includes a microprocessor, non-volatile FLASH memory for configuration storage, a battery-clock for maintaining the time and date, two ASCII terminal/modem ports, and an Ethernet LAN port for SNMP network management. The LAN port is presented as an AUI interface. There is also an optional built-in modem for dial-in access. The redundant System Manager ensures that there is a hot standby always present for configuration and control of the system.

FEATURES

In addition to transmitting data efficiently, economically and reliably, the DNX also incorporates special features. The special features include Twin Buss Architecture, Mid-Plane Flexibility, Built-In Diagnostics, Redundant System Managers and Power Modules, Console Control, SNMP, Telnet Management, User Security, and Audit Trail Identifier. Each of these features is described below.

Twin Switch Buss Architecture (TDM and ATM)

The DNX has two integrated switching busses. The TDM switch buss accommodates circuit-switched applications such as voice and video. It is ideal for today's leased-line or switched network connection-oriented services. The TDM switch buss accommodates up to 256 Mbps of bandwidth.

Future development of the ATM switch buss will address the packet-oriented or "bursty" data applications. With 1 Gbps of bandwidth, it is perfect for high-speed connectionless network services.

Mid-Plane Flexibility

The DNX employs a mid-plane design. Each DNX chassis has either 4 or 11 slots which can be used for the various application modules. There are associated slots in the rear of the DNX chassis. These slots are used for the electrical interface modules (one for each front application module). In this manner, each application module is a two- card set, with one card in the front (containing the switch-buss interface circuitry and control- processor functions) and one card in the rear (containing the electrical interface functions). These rear interface modules provide the connectors for the various interfaces (RS530, T1, XDSL, DS3, etc.). Typically, the interface modules include DTE and network connectors.

The modular construction provides flexibility for change. New interfaces can be added to existing DNX units by the addition of a front and rear application module combination. All modules can be hot-inserted and removed without disrupting the interface module and associated cabling. Application modules

may have more than one rear interface module so that different connector schemes can be supported.

A pair of half-height card slots are used for the DNX System Manager modules. These modules are fully redundant and provide two serial interfaces for console control and a LAN port for Telnet and SNMP management of the DNX equipment chassis.

Built-In Diagnostics

Diagnostic testing can be performed without the need for special test equipment. All application modules support built-in BERT and loopback tests. Testing is initiated through the console.

Redundant System Managers and Power Supplies

Optional, standby System Manager helps ensure that the DNX stays online. The standby System Manager is automatically switched in should the “online” unit fail. Each independent power supply is capable of assuming total system load.

Console Control

The system console provides complete control of the network from the central site. System configuration and testing can be accomplished by pushing a few keys to select functions and options. Password protection prevents unauthorized access to the console. Most ASCII-compatible terminals with cursor control can be used. The console port (TERM) supports terminals that operate at a rate of 1200 to 19200 bps.

SNMP and Telnet Management

Comprehensive network management capabilities include performance, error statistics, and alarm gathering. The network administrator can monitor the network from an SNMP management station, or from a PC or workstation using a telnet or dialup connection anywhere in the network.

User Security

There are four levels of security: View only, test, provisioning, and administration. Passwords are encrypted for security purposes. Refer to Section 3 of this manual for additional information on User Security.

Audit Trail Identifier

Tracks user actions and events. Refer to Chapter 3 of this manual for additional information on the Audit Trail Identifier.

APPLICATION MODULES

The DNX application modules can access the TDM buss, the ATM buss, or both as needed, depending on the module. This modular approach translates into cost-effective solutions to a variety of communications applications. The DNX can be an inexpensive channel bank, an FT3 access multiplexer, a multi-trunk T1 access node or an enterprise network ATM backbone switch. All applications modules have LED indicators that show successful tests or indicate a loopback condition or an error. Some also have LEDs that indicate alarm conditions. Refer to the individual modules for more information.

- **Quad T-1 Module** contains 4 T-1 links, a microprocessor, and FLASH memory for program storage. Supports ESF, D4 framing AMI, B8ZS Line Coding, and Out of Band signalling path for Voice.
- **Quad High Speed Data Module** contains 4 quad high speed links, a microprocessor, and FLASH memory for program storage. It supports four high-speed synchronous data ports and accommodates synchronous data rates from 48 Kbps to 2.048 Mbps.
- **Quad T-3 Module** contains 28 T-1 links, a microprocessor, and FLASH memory for program storage. Supports B3ZS Line Coding, M13 or C-bit Parity, Full statistical data for T3 link and 28 DS-1 signals, mid-plane access to all DNS modules.
- **OCU-DP Module** contains 4 data ports, a microprocessor, and FLASH memory for program storage. Diagnostics include Local, Line, and CSU Loopbacks, 63, 511 and 2047 Test Pattern Generation and Recognition. The OCU-DP Module supports data rates of 56/64K bps.
- **Quad T-1 with xDSL Module** contains 4 T-1 links, a microprocessor, and FLASH memory for program storage; the xDSL mini module fits into the rear of the T-1 module to extend the length of the T-1 line.
- **Test Access Module (TAM)** provides four independent testers to send DDS Latching Loopback codes and execute test patterns at 56 and 64 Kbps. Single keystroke mapping and commands. Use DNX-1581-5004 QHSS Interface Module for data access (i.e., attachment of external equipment).
- **Octal T1/E1 Voice Module** supports up to eight T1 or E1 circuits on a single module. Any port can be configured for either E1 or T1 on the same module. Standard T1 or E1 modes of operation are supported along with extensive diagnostic and testing capabilities.
- **Octal Voice Module** has eight Analog Voice Grade Channels per module. Three rear interface modules, including E&M, FXO, and FXS, are available for use with the Octal Voice Module. Extensive diagnostics includes a variable Frequency Tone.

NOTE: If an application module is not present in the equipment chassis, you can not access the individual screens associated with it. The menus for each application module are derived from the actual application module. Likewise, the SNMP agents for each application module reside on the card itself, if this option is selected under Configuration.

OPTIONS

Redundant Power Supplies

The DNX-11 can be equipped with dual load- sharing power supplies. Either supply is capable of assuming the full load should one of the supplies fail. The redundancy can be implemented with two AC supplies or two DC supplies. Each power supply module (PSM) has its own independent AC and DC inlet.

INDICATORS

The indicators on the DNX System Manager (DNX02350) are:

- **ONLINE** - indicates that the System Manager is “online”.
- **STANDBY** - indicates that the System Manager is in a standby state, waiting to go “online” should the other manager fail.
- **ALARM** - indicates that the System Manager is malfunctioning.
- **LAN** - indicates that data is being forwarded to/from the LAN port.
- **NVM** - indicates reads/writes to the FLASH memory.

The labels on the Manager Interface (DNX02014) are:

- **AUI** - An Ethernet LAN port, labeled AUI, provides a DB-15 pin AUI connection.
- **10baseT** - An Ethernet LAN port, labeled 10baseT, provides an RJ-45 modular connection.
- **TERM** - Ports Two console ports, labeled TERM, provide RJ-11 telco ports for terminal connections.
- **Phone Line** - An RJ-11 port, labeled PHONE LINE, is provided for modem connections.

QUAD DS-1 MODULE (DNX15104)

There are four sets of LEDs, one set for each trunk, and an ERROR LED for the DS-1 module itself.

ALARM - indicates an alarm condition has occurred on the trunk.

LOOP - indicates that a loopback condition has occurred on the trunk.

TEST- indicates that a test is being performed on the trunk.

ERROR - indicates that an error condition exists for this application module.

NOTE: During idle time (when there are no Alarm, Loop or Test conditions), all LEDs will blink simultaneously every five seconds.

QUAD HIGH SPEED DATA MODULE (DNX10814)

There are four sets of LEDs, one set for each port, and an ERROR LED for the Quad High Speed Data module itself.

- **DCD** - indicates that carrier has been detected at the port.
- **LOOP** - indicates that a loopback condition has occurred on the port.
- **TEST**- indicates that a test is being performed on the port.
- **ERROR** - indicates that an error condition exists for this application module.

NOTE: During idle time (when there are no DCD, Loop or Test conditions), all LEDs will blink simultaneously every five seconds, if this option is selected under Configuration.

Table 1: Specifications

	STANDARDS
FCC	Part 15, Sub-Part A, Part 68 Registration #2J3USA-75166-DE-N
UL	Listed per UL1950, Third Edition
CSA	C22.2 No. 0.7
AT&T	Tech Pubs 62411, 54016 and 54019A
DOC	Industry Canada 1986 5434 A
	USER INTERFACES
Synchronous Data	Input Data Rates: N x 56/64 Kbps to 2.048 Mbps Number of Ports: 44 maximum (DNX-11), 16 maximum (DNX-4) Interfaces: V.35, RS530/422, RS232, X.21
DS-1 Interface	Framing: Full ESF/D4 compatibility, AT&T 62411, 54016, ANSI T1.403 Termination: 8-position RJ48C Number of Ports: 44 maximum (DNX-11); 16 maximum (DNX-4)
	SWITCHING CAPACITY (non-blocking)
Circuit-switched	256 Mbps
Packet (ATM)*	1 Gbps
	MECHANICAL
	Dimensions DNX-11: 17”W x 10.5”H x 14” D DNX-4: 12”W x 5.25”H x 14”D ***Weight*** DNX-11: 25 lbs. max. DNX-4: 14 lbs. max. ***Mounting*** DNX-11: 19” or 23” rack DNX-4: tabletop or rack ***Power*** 90-230 VAC, 47-63 Hz, 24-72 VDC ***Environment*** 0-40 degrees C., 90% Humidity (non-condensing)

DNX-11	DNX-4
DC Inputs: -48VDC Power Input (range 38 to 60 VDC), 250W max. (Approvals based on 48+/-10%; 43.2-52.8VDC Talk Battery (5A max.) -48VDC Signalling Battery (5A max.) Maximum heat dissipation in unit from Talk and Signalling Battery is 120W. Maximum total heat dissipation in unit is therefore 370W. **AC Input:** 110VAC, 47 to 63 Hz (range 90 to 132VAC), 250W max. (Approvals based on 100 to 240, +6%-10% 200W), 220VAC, 47 to 63 Hz (Range 180 to 264VAC), 250W max.	**DC Inputs:** -24VDC (range 21.6 to 36VDC), 100W 26.4VDC. (Approvals based on 24+/-10%; 21.6 to 26.4VDC -48VDC power input (range 43-56VDC), 100W (Approvals based on 48+/-10%; 43.2 to 52.8VDC) -48VDC Talk Battery (1.5A max.) -48VDC Signalling Battery (1.5A max.) Maximum heat dissipation in unit from Talk and Signalling Battery is 48W. Total heat dissipation in DC unit is therefore 148W maximum. **AC Input:** 110VAC or 220VAC, 47 to 63Hz (range 90 to 264VAC), 125W (Approvals will be based on rating 100 to 240VAC, +6%/-10%)

2 Installation

This section provides instructions for installing a DNX.

Site Preparations

Before you install the DNX, make sure that your site has the proper communication networks and lines installed. For bridging/routing/network management applications, the site must have at least one Ethernet network in place. Depending upon the application being supported, you may also need dial-in telephone lines, leased lines, or network access lines (frame relay and/or PPP networks). Contact your service provider to ensure that the proper transmission equipment and lines are installed.

NOTE: Lead time for telephone line installation is normally 3 to 5 business days. Lead time for leased line, or network access line installation is normally 30 to 90 days.

Unpacking the DNX

All Eastern Research equipment is normally shipped in cardboard cartons with foam inserts to protect the units from shock and vibration during shipment. Upon arrival of the equipment, inspect the condition of the boxes and compare all items to the packing list. Notify Eastern Research and the carrier immediately if there are any damages or shortages.

Store the cartons and packing material in case the unit has to be shipped at a later date. Check the contents against the packing slip.

Parts List

You should receive a carton for each of the items ordered for the DNX. Each item is boxed separately. The shipment should contain the DNX-4 or DNX-11 equipment chassis and one or more of each of the following:

- System Manager Module (Front I/O)
- System Manager Interface Module (Rear I/O)
- Application Card (Front I/O module)
- Interface Module (Rear I/O)
- Power Module

Console

A system administrator uses the console to configure the interface protocol and parameters for each device port, to monitor the network, and to perform diagnostics. Access to the console is password protected.

Connection Methods

A PC, workstation, or dedicated terminal can act as the DNX console. You can connect a console to the DNX in any of these three ways:

- telnet access from a PC or workstation via an Ethernet LAN
- dial call to the DNX‘s modem port from any PC or workstation on the network
- dedicated terminal connected to the DNX’s console port

Connecting the Console

To connect the DNX console, locate the DNX System Manager Interface on the rear of the chassis, then refer to the following table.

If	Then
an asynchronous terminal will be directly connected to the DNX.	Locate the RJ-11 craft interface connector labeled TERM. Attach your terminal to this connector. Attach the power cord to the rear of the terminal and into an AC power source.
a PC or workstation in the network will dial in to the DNX.	Locate the RJ-11 telco connector labeled PHONE LINE. Insert a phone line in this connector. The DNX has a built-in modem.
a PC or workstation in the network will use an Ethernet cable to connect to the DNX.	Connect the AX to the LAN using the AUI or 10baseT Ethernet connector on the DNX System Manager interface. Users establish a telnet session to connect to the DNX. The necessary wire or cable that attaches to the connectors should be installed at your site. For pin assignments and descriptions of these interfaces, refer to Chapter 8.

Terminal Communications Parameters

Configure your terminal communications parameters as follows:

- Baud Rate: 1200, 2400, 4800, 9600 or 19200 bps (9600 recommended)
- Data Bits: 8
- Stop Bit: 1
- Parity: None
- Flow Control: None

NOTE: Some terminal manufacturers might identify the data bit configuration as 7-N-1 (seven data bits plus a “not used” parity bit) while other manufacturers might identify the same configurations 8-N-1 (eight bits including a “not used” parity bit). Check the terminal’s user manual.

LOGGING INTO THE DNX

Procedure

Once you have set up the connection to the DNX, you can log into the DNX:

1. Press **<Enter>** on your terminal keyboard to activate automatic baud rate recognition (ABR).

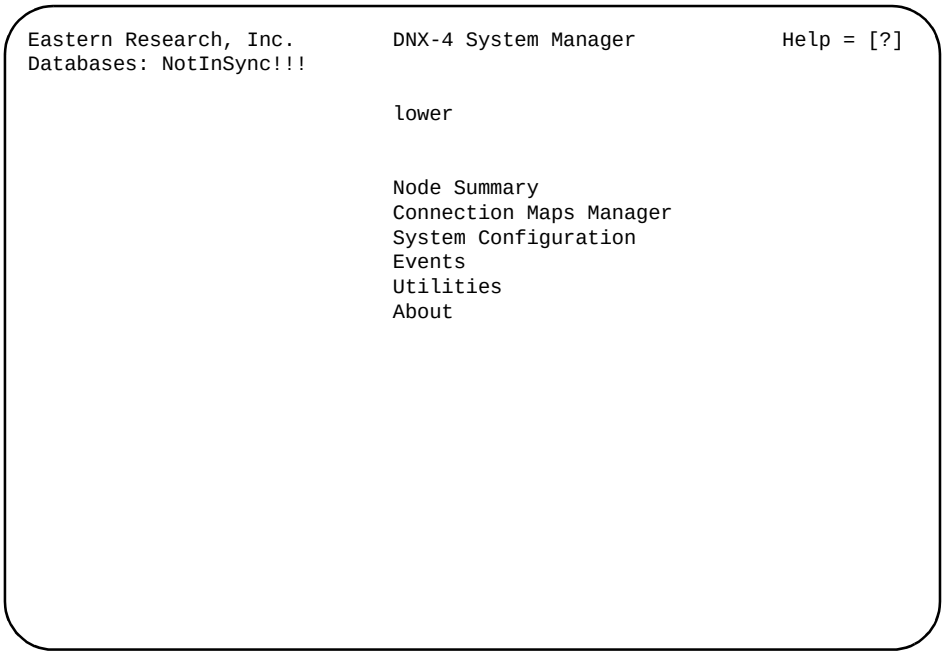
2. Enter your login name and password. To use the default login name and password, press **<Enter>** for each entry.

3. If the DNX System Manager cannot automatically detect your terminal type, the Terminal Selection Menu displays. Select your terminal type from the list.

4. When you have logged in and the DNX has determined the terminal type, the DNX Main Menu displays.

```
login:
password:

WELCOME...
Sat, Jan 28, 1998 16:22:32pm
Software 1.00F, Hardware 0.0os: 2.1



Terminal types supported:

(1)  ADDS Regent 25            (11)  Hazeltine 1500
(2)  ADDS Viewpoint            (12)  IBM 3101
(3)  Attis 4410/4425           (13)  ICL 6401
(4)  Data General DASHER       (14)  LSI ADM 11/31
(5)  Datamedia 1521            (15)  Paradyne 7811
(6)  Datamedia EXCEL 30        (16)  Qume QVT-101/102/108
(7)  Datamedia EXCEL 42        (17)  Teletype 5410/5425
(8)  DEC VT-52                 (18)  Televideo 900
(9)  DEC VT-100/131/220        (19)  Wyse WY-50
(10) Freedom 100               (20)  Wyse WY-75

Enter your terminal type [1..20]... _
```

2-1. Terminal Selection Type.



2-2. Main Menu.

DNX Main Menu Options

There are six choices on the DNX Main Menu:

Menu Option	Description
Node Summary	Provides status of each slot and access to the installed modules. Select a slot from Node Summary to configure, run diagnostics, or use utilities for the module in the selected slot. If a module is not in a slot, you can not access the screens associated with it.
Connection Map Manager	Provides options for manipulating cross-connection maps.
System Configuration	Enables you to set system parameters and administer users.
Events	Allows you to monitor events, display the event log, and send events to a host PC or workstation running syslog.
Utilities	Provides system diagnostics and utilities.
About	Displays a profile of the system manager controller and provides an entry for user identification.

MOVING THE CURSOR AND ENTERING DATA

Screen Types

The DNX user interface has two types of screens:

- **Menus** - choose a menu item, return to a previous menu or select a command listed at the bottom of the screen.
- **Menus with fields** - enter information.

Menu Actions

The following table displays the keys you would use to navigate through the DNX menus.

.

Action	Key
Move to the next item in a menu	SPACEBAR or DOWN ARROW key
Move to a previous item in a menu	BACKSPACE or UP ARROW key
Select the current option	Enter
Return to the previous menu	**X** or Esc
To access the Help screen	**?**
Select a command listed at the bottom of the screen	Type the letter indicated in brackets

Menus with Fields

Two types of fields appear on DNX menus:

- **Option fields**: These fields contain a list of the valid entries. In these fields, you scroll through the options until the option you want appears on the screen, then move to the next field.
- **Text fields**: These fields require you to type in an entry, then move to the next field.

Action	Description	Key
Cursor Movement	Move to the next field	SPACEBAR or DOWN arrow
	Move to the previous field	BACKSPACE or UP arrow
Options Fields	Scroll to the next option	Enter
	Scroll to the previous option	**B**
Text Fields	Enter text	Press Enter. When the line appears, type the new text, then press Enter again
	Clear changes and revert to last saved entry	
	Erase characters	BACKSPACE or UP arrow
Save changes	Save changes on screen and exit to previous menu	**X** then type **Y** when prompted with "Update Configuration? Are you sure (Y/N)?"
Exit without Saving	Exit to previous menu without saving changes	Esc, then type **Y** when prompted with "Abort edits? Are you sure (Y/N)?"

NOTE: To activate the values that you enter or select on the configuration screens, you must exit the screen. Diagnostic parameters are activated immediately, as soon as you change the value on the screen.

HELP MENU To list the screen navigation commands from any screen, type ?

```
*********************************************************************
*                            - HELP <?> -                           *
*                                                                   *
*  To select any menu or field on any screen, position the cursor   *
*  on the entry and press <RETURN>.                                 *
*                                                                   *
*  CURSOR MOVEMENT                                                  *
*      Move forward                      = <SPACE> / <Down Arrow>   *
*      Move backward                     = <BACKSPACE> / <Up Arrow> *
*                                                                   *
*  FIELD CHANGE                                                     *
*      Options field: Scroll forward     = <RETURN>                 *
*                     Scroll backward    = <B>                      *
*                                                                   *
*      Text field:    Update entry       = <RETURN>                 *
*                     Recall last entry  = <ESC>                    *
*                                                                   *
*  SCREEN EXIT                                                      *
*      Save any changes                  = <X>                      *
*      Abort all changes                 = <ESC>                    *
*                                                                   *
*                     - Press any key to exit -                     *
*                                                                   *
*********************************************************************
```

2-3. The Help Menu.

SUMMARY

To:	Actions:
Select a menu option	Press **SPACEBAR** or **BACKSPACE**, until cursor is located on desired option, then press **Enter**
Select a command from a menu	Type the letter that appears in brackets
Supply information on a menu with fields	Press **SPACEBAR** or **BACKSPACE** to move from field to field. To enter text, press **Enter**. When line appears, type the new text, then press **Enter** again. To select options, press **Enter** to scroll forward or **B** to scroll backwards, through list. When desired option is displayed, press **SPACEBAR** to move to the next field. **To save entries, type X** then type **Y** when prompted with “Update Configuration? Are you sure (Y/N)?” You automatically return to the previous menu.

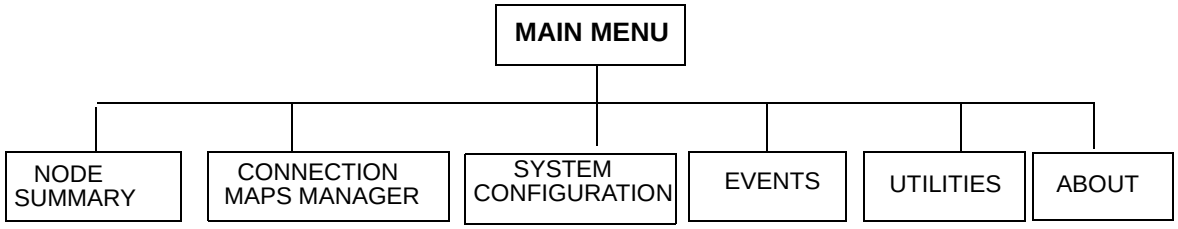
Set Up and Maintenance Activities

The following table outlines set up and maintenance activities and lists the related chapters in this guide where additional information can be found.

Activity	Description	Chapter
Define users (optional)	If you need multiple logins to the DNX, set them up **Note:** Create the system administrator's security level first.	Chapter 3
Check card and slot assignment	You may want to make sure that the card physically present in a slot matches the type of card that the slot is configured.	Chapters 3 and 5
Set system parameters	Configure port IP addresses, SNMP agent, date and time, source clock, and node name.	Configuration section of Chapters 9 through 14
Create and activate maps	You can create up to five cross connection maps. A map can be scheduled to activate or be activated manually.	Chapter 4
Monitor DNX	You can monitor events, review the event log, or log events to syslog on a PC or workstation in the network.	Chapter 6
Perform diagnostics and use utilities when needed	Use the diagnostics and utilities available for the application module. Use the DNX utilities. **Note:** Only knowledgeable users should access Utilities, since they may be service-affecting.	Chapter 7
Back up to host PC or workstation	You may choose to backup the system configuration to a host PC or workstation.	Chapters 3 and 4

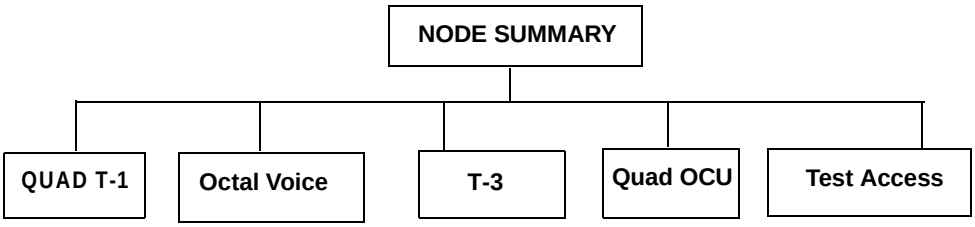
DNX MENU STRUCTURE

The console enables access to a hierarchy of menus. This section briefly describes each menu.



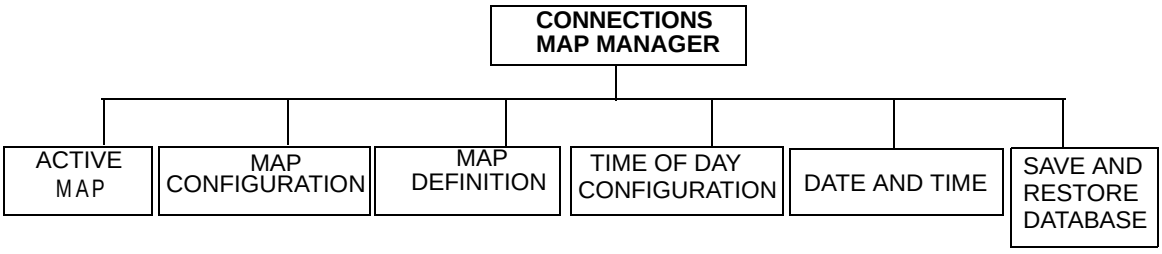
2-4. Main Menu Structure.

The **Main Menu** is the top-level menu. It provides access to the Node Summary, Connection Maps Manager, System Configuration, Events, Utilities, and About sub-menus.



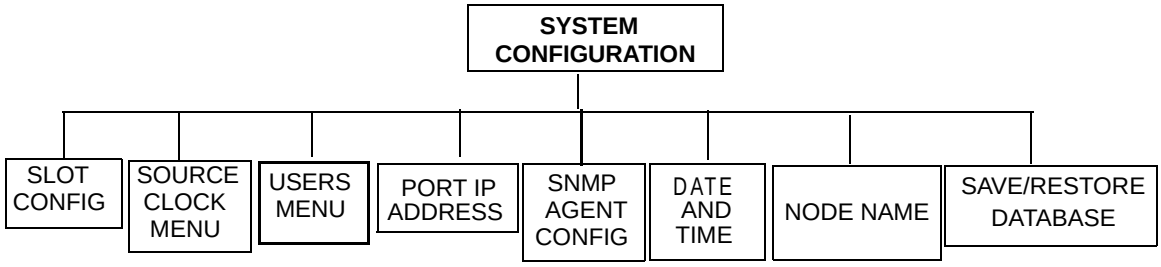
2-5. Node Summary Menu Structure.

The **Node Summary Menu** provides access to the modules *you have selected* for your DNX system (just a few are shown above). From the application-specific submenu, you can view and change all application parameters. The commands and parameters associated with each of the Node Summary screens are explained in detail in Chapter 5 of this manual.



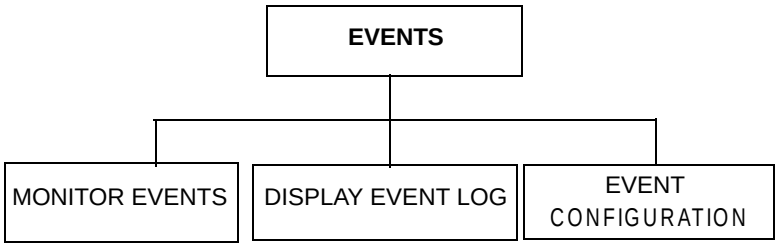
2-6. Connections Map Manager Menu Structure.

The **Connection Maps Manager** provides access to submenus for configuring, defining and testing connections as well as establishing time of day map activations. See Chapter 4 of this manual.



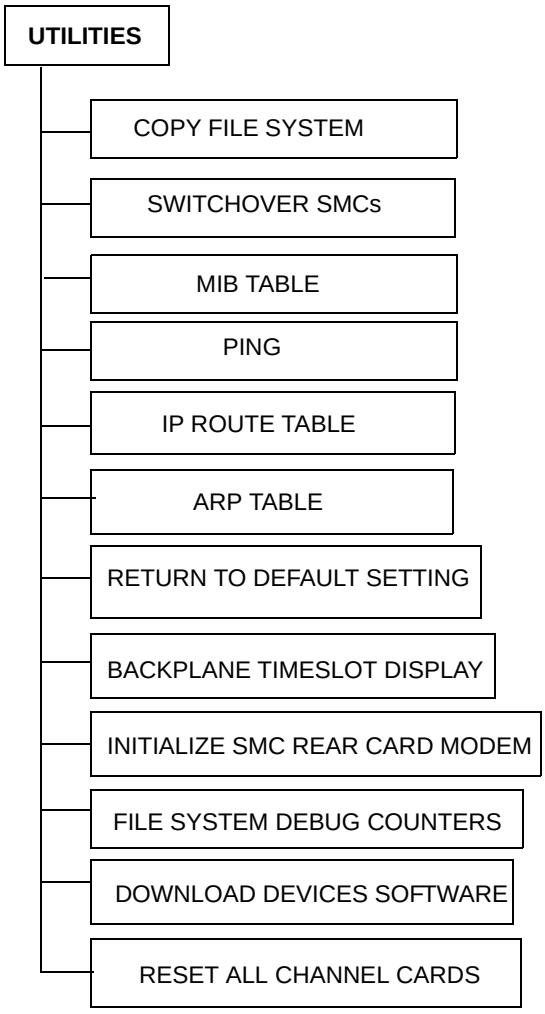
2-7. System Configuration Menu Structure.

The **System Configuration Menu** provides access to submenus for configuring slots, the source clock, port IP addresses, SNMP agent and such database management tasks as setting the time, date, node name and password, and saving/restoring a configuration to/from a remote host. The commands and parameters associated with each of the system configuration screens are explained in detail in Chapter 3 of this manual.



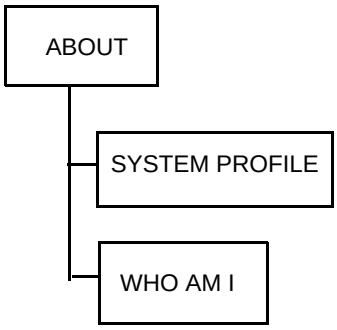
2-8. Events Menu Structure.

The **Events Menu** provides the user with the ability to monitor and display system events. The commands and parameters associated with each of the events screens are explained in detail in Chapter 6 of this manual.



2-9. Utilities Menu.

The **Utilities Menu** provides the ability to access system routing utilities, copy system files, download software, return to default settings, and view back-plane timeslots. The commands and parameters associated with each of the utilities screens are explained in detail in Chapter 7 of this manual.



2-10. About Menu.

The **About Menu** provides the ability to retrieve personal security information.

Procedure

To do:

1. From the DNX Main Menu, select **About**, then select **Who Am I**.
2. Provide the password for the current session. The DNX displays *Name, Security level,* and *Security Mask* of the user.

The DNX can support up to 20 different users and up to four simultaneous telnet sessions. The Administrator maintains the user information, including adding, changing or deleting users.

Individual users can display information for their own login. If a user forgets their password, only the Administrator can change their password.

3 System Manager Configuration

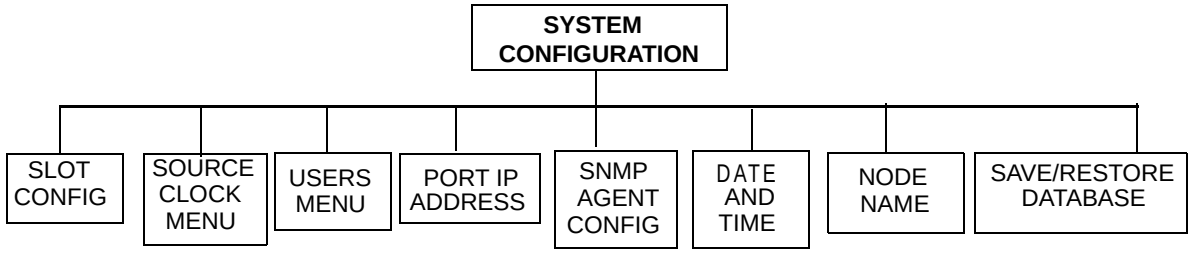
The Configuration Menu provides access to eight submenus. From this menu, you can view and change all DNX configuration parameters that pertain to the System Manager. Refer to Chapter 2 for an explanation of the menu procedures.

Before You Begin

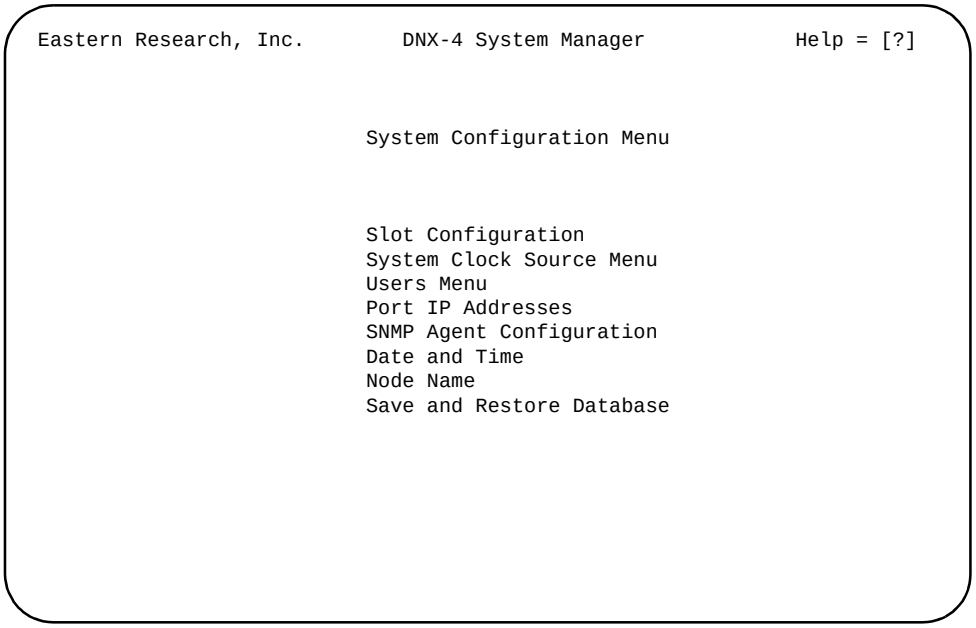
Make sure you are familiar with the screen navigation commands described in Chapter 2.

To list the screen navigation commands, press the **?** key.

Reminder: **To activate the values that you enter or select on the configuration screens, you must exit the screen. Diagnostic parameters are activated immediately, as soon as you change the value on the screen.**



3-1. System Configuration Menu Structure.



3-2. System Configuration Menu.

System Configuration Menu Options

There are eight choices on this menu:

Menu Option	Function
Slot Configuration	**Enables you to display or change the card type associated with a slot. Also enables you to assign a name to a slot.**
System Clock Source Menu	**Enables you to define primary, secondary, and tertiary sources for the system clock.**
Users Menu	**Administer user logins. First login established should have administration security level.**
Port IP Addresses	**Define IP address of the DNX.**
SNMP Agent Configuration	**Define characteristics of the SNMP Agent.**
Date and Time	**Set or verify current date and time.**
Node Name	**Assign name to the DNX.**
Save and Restore Database	**Save/restore database from host PC or workstation.**

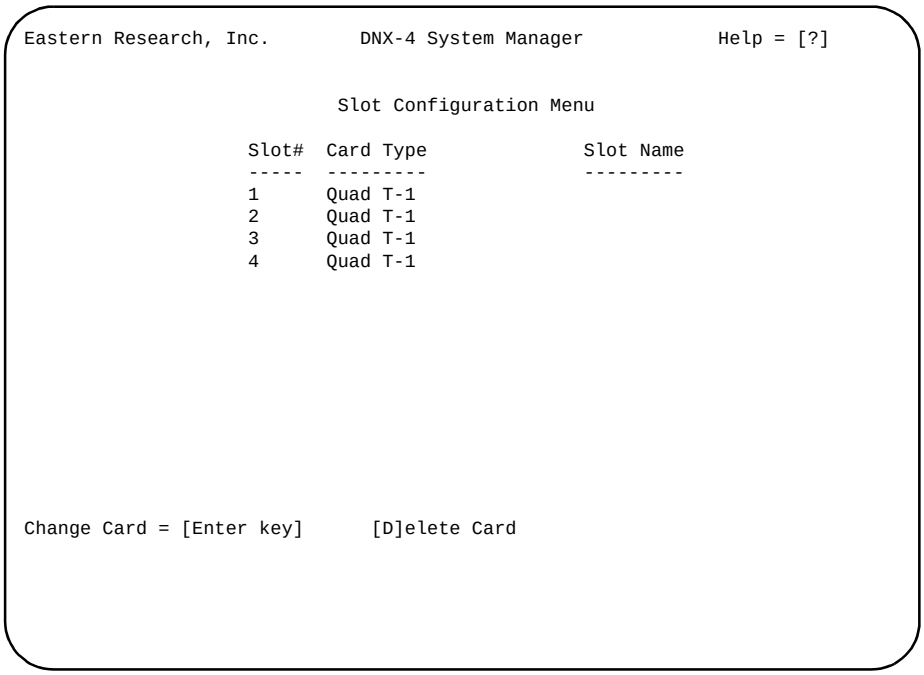
Use the System Configuration menu to identify a slot with a Slot Name and Card Type. (See If/Then box below).

If	Then
the slots are empty	you can pre-configure the slots by assigning each slot a Slot Name and Card Type.
the slots contain application modules	the DNX has already identified the card type for each slot. You can use the Slot Configuration Menu to assign slot names. Verify that the Configured Type and Actual Type match on the Node Summary screen.

CONFIGURING THE SLOT

Procedure

1. From the Main Menu, select System Configuration, then select Slot Configuration. The following menu appears.



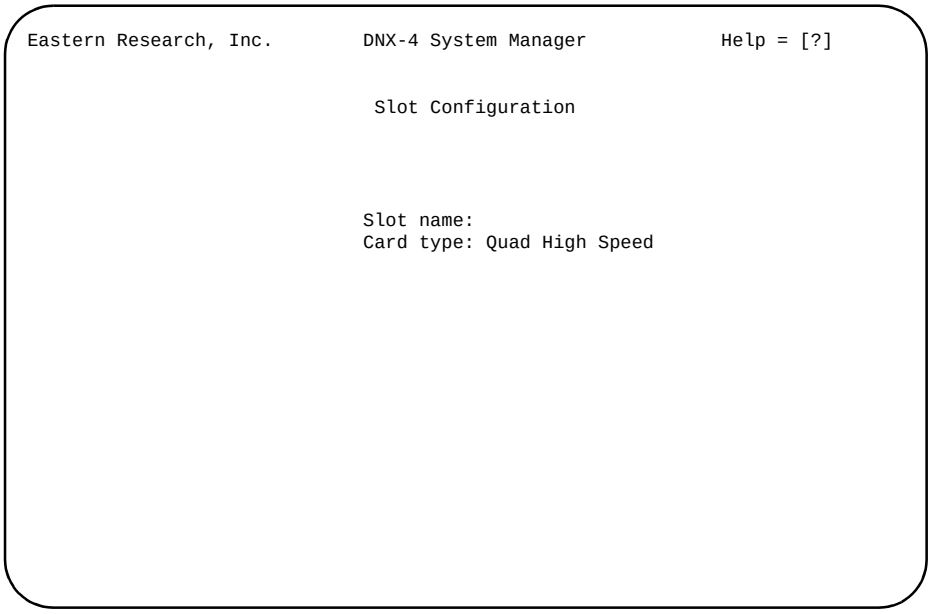
3-3. Slot Configuration Menu.

This menu will show 4 or 11 slots, depending upon the equipment nest you have.

Procedure

To add a card to a slot or to change an existing card in a slot:

2. Position the cursor next to the slot you wish to configure and press **<Enter>**. The following menu appears.



3-4. Card Slot Menu.

3. Press **<Enter>**, type in a Slot name, and press **<Enter>** again.
4. Select a Card type. Place your cursor on Card type and press **<Enter>** to scroll through the card options until the desired card appears.
5. To save changes, type **X**.
6. When prompted: “Update Configuration? Are you sure? (Y/N)” Type **Y**.
7. Type **X** to return to the Slot Configuration Menu.

SLOT CONFIGURATION FIELD DESCRIPTIONS

Slot Name: (text field). Specify a name for the slot, up to 11 alphanumeric characters.

Card Type: (option field). Select a card type: Quad T-1, Quad High Speed, T-3, Quad OCU, Octal Voice, Octal T-1/E-1, or Test Access.

DELETING SLOT CONTENTS

Before you begin

When a card is physically removed from a slot, you can delete it through the Slot Configuration Menu.

NOTE: The card's configuration files are stored on the System Manager Card. When a card is replaced, the old configuration is preserved.

Procedure

To delete a card from a slot in the DNX:

1. From the Main Menu, select System Configuration, then select Slot Configuration.
2. Select the Slot # where the card was located, then type **D**.
3. You will receive this message: "All existing connections for this slot will be deleted! Are you sure (Y/N)?"
4. Type **Y**. The command executes and you return to the previous menu.

CONFIGURING THE SOURCE CLOCK

You can identify up to three sources to use as a reference for the system clock.

Procedure

To configure the source clock:

1. From the Main Menu, select System Configuration, then select System Source Clock Menu. The System Clock Source Menu displays.

```
Eastern Research, Inc.        DNX-4 System Manager          Help = [?]


                             System Clock Source Men

Mode.......: Primary
Primary....: 01 -                      Port: 0
Secondary..: Freerun                   Port: N
Tertiary...: Freerun                   Port: N


Current Clock Source
--------------------

             Freerun                   Port: N
```

3-5. System Clock Source Menu.

2. Select the Mode. If you are indicating Primary, Secondary, Tertiary sources, specify the slot and port number for each.
3. To save changes, type **X**.
4. When prompted: “Update Configuration? Are you sure (Y/N)?” Type **Y**.

SOURCE CLOCK FIELD DESCRIPTIONS

Mode: (Option field) The options are **Primary, Secondary, Tertiary** or **Automatic.**

If the mode is set to **Primary, Secondary** or **Tertiary**, then only that clock source will be used. If the mode is set to automatic, then the DNX System Manager will choose the highest priority clock source that is currently available. If any clock source fails and no other is available, the system defaults to free run which is an internal clock source that is always available.

If the mode is set to Automatic, then the DNX System Manager will choose the highest priority clock source that is currently available. If any clock source fails and no other is available, the system defaults to freerun which is an internal clock source that is always available.

NOTE: **The Automatic Mode is recommended.**

Primary/Secondary/Tertiary Clock Sources: (Option field) Choose a slot and port number or select freerun. **On the Quad High Speed card, only port 1 may be used as the source clock.**

USER PROFILE MANAGER MENU

The Administrator uses the User Profile Manager Menu to add, change, or delete user information. To access the User Profile Manager Menu, from the DNX Main Menu, select System Configuration, then select Users Menu. The Users Profile Manager Menu displays.

To configure the Users Profile Manager for security purposes, navigate to the Users Menu:

```
Eastern Research, Inc.    DNX 4 - System Manager          Help = [?]

                           Users Profile Manager Menu

Name        Id    Rights     Status      Name    Id    Rights   Status
-----------------------------------   ----------------------- ------
alpha       123   View Only
terri       ter   Admin      Logged In




[A]dd user      [D]elete user
```

3-6. Users Profile Manager Menu.

For each user, the Users Profile Manager Menu displays:

- Name
- Audit trail identifier (Id). this appears on events in the Event Log.
- Assigned rights (Rights)
- Login status (Status)

All passwords are encrypted and not shown.

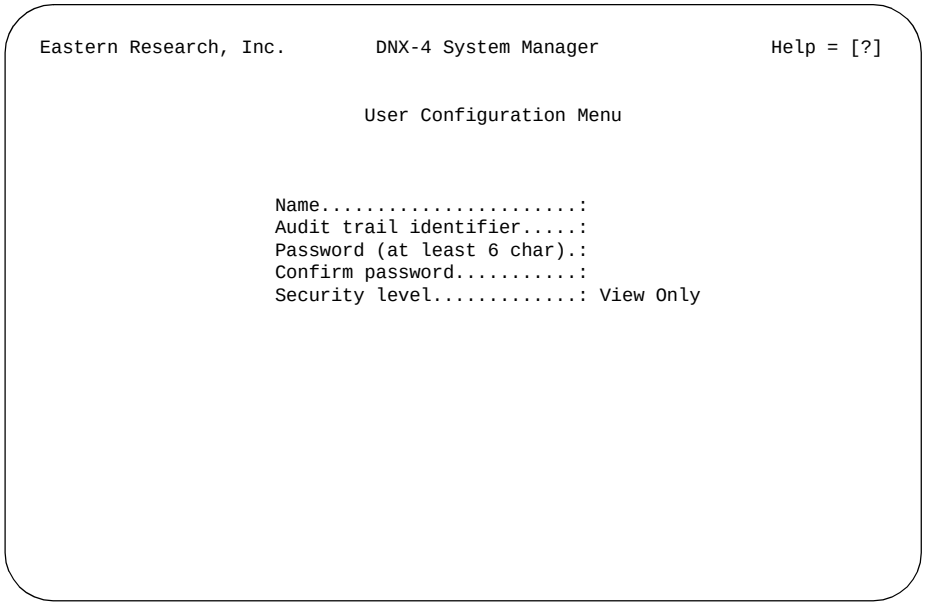
ADDING A USER

The Administrator can add new users. The DNX system allows up to 20 different users; duplicate names are not accepted.

Procedure

To add a user:

1. From the DNX Main Menu, select System Configuration. Place your cursor on the System Configuration field and press **<Enter>**.
2. Place your cursor on the Users field and press **<Enter>**.
3. Press **A** and a new screen appears.



3-7. User Configuration Menu.

4. Enter a Name, Audit trail identifier, password, and confirm the password. Select a Security level.
5. To save changes, type **X**.
6. When prompted: “Update Configuration? Are you sure (Y/N)?” Type **Y**.

USER CONFIGURATION MENU FIELD DESCRIPTIONS

Name - enter a name of up to 11 alphanumeric characters. This name will appear in the name header field on the Users Profile Manager Menu.

Audit Trail Identifier - enter an ID of up to ***three*** alphanumeric characters. This three character identification will appear in the ID header field on the Users Profile Manager Menu. The event of adding, deleting or changing any user's configuration is considered to be an audit trail event. An audit trail event message starts with the audit trail identifier and then **>>** to indicate it is an audit trail message. Other user information that include login or logout is considered a regular event message. Since multiple logins of the same user are allowed, the login and logout event message includes the user name as well as total login number of that user.

Password - enter a password of at least ***six*** characters or else an error will occur upon exit. Your password ***will not*** appear on any menu.

Confirm Password - type in the password entered in the password field to confirm your password.

Security Level - the level of user rights that are configured through the User Configuration Menu. Your security level will appear in the Rights header field on the Users Profile Manager Menu.

- ***View Only*** - users at this level can view registers, circuit maps, and overall system configurations.
- ***Test*** - users at this level can maintain all of the privileges from View Only, plus the ability to initiate and terminate BERT tests and loopbacks as well as clear performance registers.
- ***Provisioning*** - users at this level can access all of the DNX features except for the ability to add and remove new users or TFTP new code down to the system.
- ***Administration*** - the highest level of access. Users at this level can access all DNX functions and can add/remove users from the system. This user should not be able to view another user's password. This user is able to delete and add new passwords in the event a user has forgotten his password.

NOTE: Refer to the SMC User Security System chart at the end of this section for a look at each level of access.

CHANGING USER INFORMATION

The Administrator can change any information associated with a *Login Name*, including the password. The *Login Name* cannot be changed once entered. Instead, the Administrator deletes the login and enters a new login name.

Procedure

To change user information:

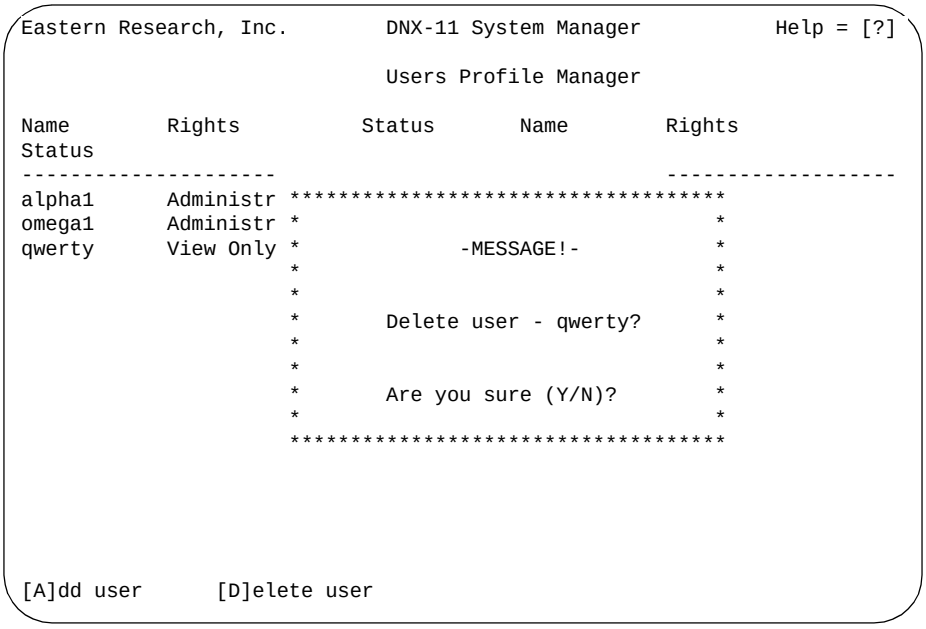
1. From the DNX Main Menu, select System Configuration, then select Users Menu. The Users Profile Manager menu
2. Select the user login to be changed using the **SPACEBAR**, **BACKSPACE** or **arrow keys**, then press **<Enter>**.
3. Edit the information on the User Configuration Menu. For details, refer to the previous section “User Configuration Fields.”
4. To save changes, type **X**.
5. When prompted: “Update Configuration? Are you sure (Y/N)?” Type **Y**.

DELETING A USER

Procedure

To delete a user:

1. From the Users Profile Manager Menu, put the cursor on the Name of the user to be deleted and press **D**.
2. At the “Are you sure? (Y/N)” prompt, enter **Y** to confirm.



3-8. Delete User.

3. Press **X** to return to the System Configuration Menu.

CONFIGURING THE PORT IP ADDRESS

Procedure

To configure the Port IP address for the DNX:

1. From the Main Menu, select System Configuration. Place your cursor on System Configuration and press **<Enter>**.
2. Then select Port IP Addresses. Place your cursor on the Port IP Addresses field and press **<Enter>**. The following screen appears.

```
Eastern Research, Inc.        DNX-4 System Manager           Help = [?]


                            Port Configuration Menu


              IP encapsulation.................: Ethernet II
              LAN IP address...................: 0.0.0.0
              LAN IP mask......................: 255.255.255.0

              Enable RIP.......................: No
              Default gateway (if RIP disabled): 0.0.0.0

              Backplane IP address.............: 200.0.0.0
              Backplane IP mask................: 255.255.255.0

              Backplane IP Address Management
              -------------------------------

              Backplane IP translation.........: Yes
              Configure slot's IP table
```

3-9. Port Configuration Menu.

3. Specify information on the Port Configuration Menu.
4. If you select **Yes** for Backplane IP translation, the Backplane Address Configuration Menu displays. Type **S** to set the addresses.
5. Type **X** to save and exit to the previous menu. Confirm action when prompted, by typing **Y**.

CONFIGURING THE IP ADDRESS

```
Eastern Research, Inc.        DNX-4 System Manager            Help = [?]

                          Backplane address configuration

                              Slot 01: 1.2.2.2
                              Slot 02: 200.0.0.2
                              Slot 03: 200.0.0.3
                              Slot 04: 200.0.0.4









[S]et sequential IP addresses
```

3-10. Backplane Address Configuration Menu.

PORT IP ADDRESS FIELD DESCRIPTIONS

IP Encapsulation: (option field) Ethernet LANs use two types of IP frame encapsulation. The encapsulation should match that used by other IP workstations and hosts on the LAN. The choices are Ethernet II or 802.3.

LAN IP Address: (text field) This parameter is used to specify the LAN IP address. IP addresses are 32 bits long and written as four decimal digits separated by a period. Each digit represents 8 bits of the address. The range of each digit is from 0-255.

Enter an IP address in dotted decimal form. If you do not know your IP address, consult your network administrator.

LAN IP Mask: (text field) The LAN IP mask is a 32-bit number represented in the same way as the IP address. A default mask is automatically generated; however, it can be overridden to support subnetting. Subnetting allows you to allocate bits from the host portion of the IP address as an extension to the address. Depending on the type of IP network you are using (Class A, B or C), the subnet mask may be 24, 16 or 8 bits in length.

Enable RIP/Default Gateway: (option field) This parameter enables/disables RIP on the LAN port. If RIP is not enabled, you must program a default gateway.

Backplane IP address: This parameter is used to specify the based backplane IP address. The backplane IP address facilitates the management and control of the application modules.

Each application module uses one IP address. The IP address of an application module is calculated by adding the last digit of the based backplane IP address to the slot number. For example, if the last digit of the based backplane IP address is 6 and the application module is in slot 1, the IP address of the application module would be 200.0.0.7.

The backplane address defaults to 200.0.0.0. The default is recommended unless it conflicts with an existing IP network.

Backplane IP mask: The backplane mask defaults to 255.255.255.0, and defaults according to class (Class A, B or C).

Backplane IP translation:

- Select ***"Yes"*** to expose card to have an IP address as SMC
- Select ***"No"*** to key off Backplane IP address

CONFIGURING THE SNMP AGENT

Procedure

To configure the SNMP Agent:

1. From the Main Menu, select System Configuration. Place your cursor on the System Configuration field and press **<Enter>**.
2. Then select SNMP Agent Configuration. Place your cursor on the SNMP Agent Configuration field and press **<Enter>**.

```
Eastern Research, Inc.        DNX-4 System Manager                    Help = [?]

                          SNMP Agent Configuration Menu

System Group Parameters
-----------------------
System domain name....: w
System description....: ERI - DNX - Release 6.03
System location.......: lk;sd
System contact........: enter contact name here

Trap Controls
-------------
Traps.................: Disabled
Authentication traps..: Disabled

Client-manager IP Addresses             Community Profiles
---------------------------             ------------------
(used for trap destinations)            Read-only:          Read-write:
0.0.0.0             0.0.0.0             public              public
0.0.0.0             0.0.0.0             public              public
0.0.0.0             0.0.0.0             public              public
0.0.0.0             0.0.0.0             public              public
```

3-11. SNMP Agent Configuration Menu.

3. Specify the parameters for the SNMP Agent.
4. Type **X** to save and exit to the previous menu.
5. To confirm action when prompted, type **Y**.

CONFIGURING THE SNMP AGENT FIELD DESCRIPTIONS

SYSTEM GROUP PARAMETERS

System domain name: This field is used to uniquely identify the DNX system. (It sets the MIB-II sysName variable.)

System description: This field is a description of the DNX system. It includes the full name and version identification of the system's hardware type, software operating system, and networking software. The field is not programmable by the user. (It sets the MIB-II sysDescr variable.)

System location: This field defines the physical location of the DNX system (i.e., Utility Room, Ground floor). It can contain up to 48 ASCII characters. (It sets the MIB-II sysLocation variable.)

System contact: This field identifies the contact person for the DNX system, and provides information on how to contact this person. It can contain up to 48 ASCII characters. (It sets the MIB-II sysContact variable.)

TRAP CONTROLS

Traps: This parameter enables/disables trap messages.

Trap Authentication: When this parameter is enabled, the DNX sends authentication traps when an SNMP request is received with an invalid community string. If the strings do not match, access is denied. If the strings match, read-only or read/write access is provided, depending on the community string matched. The traps are prevented when the parameter is disabled.

Client-Manager IP Addresses [Default: 0.0.0.0]: The Client-Manager IP Addresses must be entered in "dotted decimal notation" form. Each of the four numbers in the address can range from 0 to 255. The addresses should match the addresses of the SNMP network management station that should receive the SNMP trap messages generated by the DNX. Up to 8 addresses can be entered. If no address is entered, the DNX sends its traps to the last manager that sent SNMP messages to the unit.

COMMUNITY PROFILES

Read-Only Community [Default: Public]: This is the community string used for the read-only access to the DNX's MIB objects.

Read-Write Community [Default: Private]: This is the community string used for read-write access to the DNX's MIB objects. If this parameter is set to the same value as the Read-Only Community profile, write access will be denied.

Setting The Date And Time

Make sure the system date and time are correctly set. The date and time is used for scheduling maps and may appear on the SNMP statistics.

NOTE: For convenience, the Date and Time option can be set from either the Connections Map Menu or the System Configuration Map.

Procedure

To change the date and time settings, follow these steps:

1. From the Main Menu, select System Configuration. Place your cursor on the System Configuration field and press **<Enter>**.
2. Then select Date and Time. Place your cursor on the Date and Time field and press **<Enter>**.

```
Eastern Research, Inc.        DNX-4 System Manager            Help = [?]


                               Date and Time Menu


                              Month.....: November
                              Day.......: 6
                              Year......: 1998
                              Hour......: 16
                              Minute....: 27
                              Second....: 45
                              Day.......: Friday
```

3-12. Date and Time Menu.

3. Scroll through the options for each field until the correct values display on the screen.

Reminder: **Press <Enter> to scroll forward through the options or type B to scroll back. Press SPACE, BACKSPACE, or use the arrow keys to move between fields.**

4. Type **X** and confirm action when prompted, by typing **Y**. Changes are saved and you return to the System Configuration menu.

Date and Time Option Fields

Month: options are January through December

Day: options are 1 through 31

Year: default is 1998. Change to current year. The DNX is year 2000 compliant.

Hour: options are 1-24.

Minute: options are 0 through 59.

Day of Week: options are Sunday through Saturday.

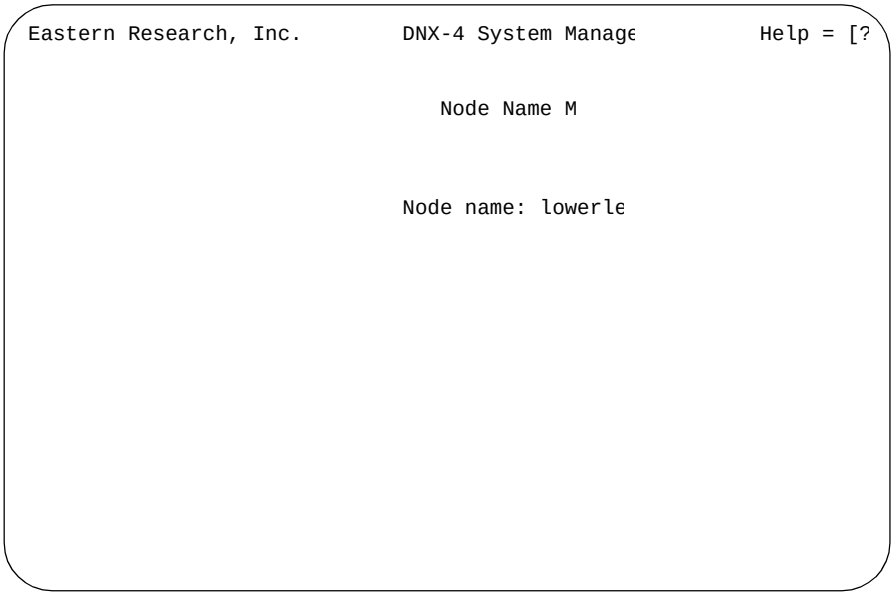
ASSIGNING A NODE NAME

You can assign a name to the DNX system that will appear on the DNX Main Menu.

Procedure

To name the DNX system, use the following procedure:

1. From the Main Menu, select System Configuration. Place your cursor on the System Configuration field and press **<Enter>**.
2. Then select Node Name. Place your cursor on the Node Name field and press **<Enter>**.



3-13. Node Name Menu.

3. Enter a **Node Name** and press **<Enter>**. The node name field accepts a name consisting of up to 19 alphanumeric characters.
4. Type **X**. To confirm action when prompted, type **Y**. Changes are saved and you are returned to the previous menu.

SAVE AND RESTORE DATABASE

The DNX system provides the capability to save the system configuration database as a software file and to restore the system configuration from previously saved software files.

Since the system configuration is software-based, standard protocols like the TFTP can be utilized to transfer the system configuration database to a remote host (PC or workstation). Conversely, files that have been uploaded to a remote host for archival purposes can be downloaded to a DNX disaster recovery or to facilitate system configuration on new installations.

NOTE: For convenience, the Save/Restore Database option is also available from the Connection Maps Menu.

SAVING THE DNX'S CONFIGURATION TO A HOST

The SAVE operation gathers all of the files that exist on the DNX, compresses them, and then sends them to the host.

If you plan to save more than one DNX to the host, remember to enter a unique name for each file so that existing files do not get overwritten.

Procedure

To save the DNX's configuration to a host:

1. Create a directory on the host that will store the DNX's configuration.
2. Run the host's TFTP server.
3. From the DNX Main Menu, select System Configuration. Place your cursor on the System Configuration field and press **<Enter>**.
4. Then select Save/Restore Database. Place your cursor on the Save/Restore Database field and press **<Enter>**. The following screen appears.

```
Eastern Research, Inc.        DNX-4 System Manager          Help = [?]

                          Save and Restore Database Menu


Host IP address.: 193.222.333.444
Host directory..: d:\
Host file name..: upper









[S]ave Database      [R]estore Database
```

3-14. Save and Restore Database Menu.

5. Enter the remote host's IP address and the directory on the host where the DNX's files are to be saved. Specify the file name for the file on the host. It is recommended that you change this name if you plan to save more than one DNX to the host.
6. Type **S** to execute the Save Database command and exit the menu.
7. Type **Y** at the confirmation screen. The progress of the transfer will appear on the screen. If there are any errors, correct the problem and perform the *SAVE* again.

RESTORING THE DNX'S CONFIGURATION DATA FROM A HOST

The RESTORE operation gathers the backup file from the host and restores the files on the DNX's System Manager Cards.

When you restore the file names, the file name on the host will have a .b extension.

Procedure

To restore the DNX's configuration from a host:

1. Run the host's TFTP server.
2. From the DNX Main Menu, select System Configuration, then select Save/Restore Database.

```
Eastern Research, Inc.        DNX-4 System Manager           Help = [?]

                          Save and Restore Database Menu


Host IP address.: 193.222.333.444
Host directory..: d:\
Host file name..: upper









[S]ave Database      [R]estore Database
```

3-15. Save and Restore Database Menu.

3. The remote host's IP address and directory where this DNX's configuration was saved will appear in the proper fields. If incorrect, enter the correct information.
4. Type **R** to execute the Restore Database command and exit the menu.
5. Type **Y** at the confirmation screen. The progress of the transfer will appear on the screen. If there are any errors, correct the problem and perform the restore again. After the files have been transferred, the system will re-initialize itself with the restored configuration.

SAVE AND RESTORE DATABASE FIELD DESCRIPTIONS

Host IP Address: This field is used to specify the remote host's IP address. IP addresses are 32 bits long and written as four decimal digits separated by a period. Each digit represents 8 bits of the address. The range of each digit is from 0 - 255.

Enter an IP address in dotted decimal form. If you do not know the remote host's IP address, consult your network administrator.

Host Directory: This field is used to specify the directory on the remote host where the DNX's files are to be saved. A maximum of up to eight characters is allowed in this field.

Host File Name: The host file name, as shown in Figure 3-12, is the default name. It is strongly recommended that you change this name if you plan to save more than one DNX to the host. When you restore file names, the file name will have a .b extension. A maximum of up to eight characters is allowed in this field.

SMC USER SECURITY SYSTEM CHART

The SMC User Security Chart summarizes the menus that can be accessed by each user security level.

Menu Name	View Only Level	Test Level	Provision Level	Admin Level
	Read/Write	Read/Write	Read/Write	Read/Write
CONNECTIONS MAP MANAGER				
Active Map	Y/Y [1]	Y/Y [3]	Y/Y	Y/Y
Map Config	Y/Y [2]	Y/Y [4]	Y/Y	Y/Y
Map Definition	Y/N	Y/N	Y/Y	Y/Y
Time of Day Configuration	Y/N	Y/N	Y/Y	Y/Y
Date and Time	Y/N	Y/N	Y/Y	Y/Y
Save and Restore	X/X	X/X	Y/Y	Y/Y
SYSTEM CONFIGURATION				
Slot Configuration	Y/N	Y/N	Y/Y	Y/Y
System Clock Source	Y/N	Y/N	Y/Y	Y/Y
Users Menu	X/X	X/X	X/X	Y/Y
Port IP Addresses	Y/N	Y/N	Y/Y	Y/Y
SNMP Agent Configuration	Y/N	Y/N	Y/Y	Y/Y
Date and Time	Y/N	Y/N	Y/Y	Y/Y
Save/Restore Database	X/X	X/X	Y/Y	Y/Y
EVENTS				
Monitor Events	Y/N	Y/N	Y/Y	Y/Y
Display Event Log	Y/NA	Y/NA	Y/NA	Y/NA
Event Configuration	X/X	X/X	Y/Y	Y/Y
UTILITIES				
Copy File System	X/X	X/X	Y/Y	Y/Y
Switchover SMCs	X/X	X/X	Y/Y	Y/Y
MIB Table	Y/NA	Y/NA	Y/NA	Y/NA
Ping	X/X	X/X	Y/Y	Y/Y
IP ROUTE TABLE				
Show IP Route	Y/Y	Y/Y	Y/Y	Y/Y
Dump IP Route	Y/NA	Y/NA	Y/NA	Y/NA
ARP Table	Y/NA	Y/NA	Y/NA	Y/NA

Return to Default Setting	**X/X**	**X/X**	**X/X**	**Y/Y**
Backplane Timeslots Display	**Y/NA**	**Y/NA**	**Y/NA**	**Y/NA**
Initialize SMC Rear Card Modem	**X/X**	**X/X**	**X/X**	**Y/Y**
File System Debug Counters	**Y/NA**	**Y/NA**	**Y/NA**	**Y/NA**
Download Devices Software	**X/X**	**X/X**	**X/X**	**Y/Y**
Reset All Channel Cards	**X/X**	**X/X**	**Y/Y**	**Y/Y**
ABOUT				
System Profile	**Y/NA**	**Y/NA**	**Y/NA**	**Y/NA**
Who Am I	**Y/Y**	**Y/Y**	**Y/Y**	**Y/Y**

LEGEND:

- **Y [1]** - viewer can filter and use display related keys only
- **Y [2]** - viewer can not access any function keys at the Configuration Maps Menu but can do filter and use display related keys at the Map Configuration Screen
- **Y [3]** - tester can access all other keys except add/listen/delete connection
- **Y [4]** - tester can not access any function keys at the Configuration Maps Menu but can use all keys except add/listen/delete connection at the Map Configuration Screen
- **Y** - yes, can read/write
- **N** - no, can not read/write
- **X** - inaccessible at this level
- **NA** - not applicable

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4 Connection Maps Manager

The Connection Maps Manager Menu provides access to six submenus. From this menu, you can define, configure and activate all parameters pertaining to the DNX connection maps. Refer to Chapter 2 for an explanation of the menu procedures.

DNX Architecture

The DNX utilizes a distributed cross-connect fabric. DNX does not have a typical DCS architecture utilizing a cross-connect matrix or matrices to groom DS-0 signals from one WAN link to another. Using DNX, each system application module has its own matrix or cross-point switch that provides access and egress to the midplane buss.

Connection Map

An image of each application module's configuration including cross-connections is stored on the individual module, as well as in a software-defined "Map" that is stored on the System Manager Card.

You can have up to five maps on the DNX. The Active Map is the one in use by the DNX. Only one map can be active on the system at any instance.

```
Eastern Research, Inc.        DNX-4 System Manager            Help = [?]

                   Map Configuration:   Map 01
Note: You must exit this menu in order to update the switch map

Name                 Src      Dest   Speed Type  Active Test Tester Port
-------------------------------------------------------------------------
QHS 3.1 TO QHS 3.2  03.01.01  03.02.01 0056k D  FDX
QHS 3.3 TO QHS 3.4  03.03.01  03.04.01 0056k D  FDX
QT1 4.1 TO QT1 4.2  04.01.01  04.02.01 0056k D  FDX
QT1 4.3 TO QT1 4.4  04.03.01  04.04.01 0056k D  FDX
--
--
--
--
--
--
--
--

Connection Filter: Not Active

[F]ilter                     [A]dd/[L]isten/[D]elete connection
[T]est set up/[R]estore      [H]ome/[E]nd/[N]ext/[P]rev page
```

4-1. Sample Map.

Multiple Maps

There are several advantages to multiple maps:

- Maps provide a flexible tool that help you manage the changing needs of your network.
- A standby map can be activated quickly should problems arise in the active map.
- A map can be used to try out new connections or deletions. For example, you can create a map with new connections and activate it. If problems occur, you can quickly activate another map with a known working configuration, thereby restoring service and minimizing any outages.
- A map can include your features that are needed only occasionally. For example, you can create a map with a video-conference and activate it only when it is needed.
- You might want to have different maps active at specific times of the day, depending upon the needs of your network. For example, you could have a daytime map with more voice than data connections and then a nighttime map with more data than voice connections.

Activating Maps

Maps can be activated manually or by using the system's Time of Day (TOD) automatic activation feature. The following figure shows a sample schedule. For each day, you can schedule up to five maps. Each entry includes the time that the map will be activated in 24-hour notation and the Map Name.

```
Eastern Research, Inc.      DNX System Manager            Help = [?]
                          Wednesday, November 11 15:58
Time Of Day Configuration Manager Enabled:Yes    ActiveMap:Map 01

|  Sun  |  Mon  | Tues  |Wednes | Thurs |  Fri  |Sat    |
|-------|-------|-------|-------|-------|-------|-------|
| 06:00 | 06:00 | 06:00 | 06:00 | 06:00 | 06:00 |06:00  |
|Daily  |Daily  |Daily  |Daily  |Daily  |Daily  |Daily  |
|-------|-------|-------|-------|-------|-------|-------|
| 20:00 | 20:00 | 10:00 | 20:00 | 20:00 |20:00  |20:00  |
|Night  |Night  |Special|Night  |Night  |Night  |Night  |
|-------|-------|-------|-------|-------|-------|-------|
| 00:00 | 00:00 | 12:00 |00:00  |00:00  |00:00  |00:00  |
|...    |...    |Daily  |...    |...    |...    |...    |
|-------|-------|-------|-------|-------|-------|-------|
| 00:00 | 00:00 | 20:00 | 00:00 | 00:00 |00:00  |00:00  |
|...    |...    |Night  |...    |...    |...    |...    |
|-------|-------|-------|-------|-------|-------|-------|
|00:00  | 00:00 | 00:00 | 00:00 | 00:00 | 00:00 | 00:00 |
|...    |...    |...    |...    |...    |...    |...    |
|-------|-------|-------|-------|-------|-------|-------|
```

4-2. Sample Time and Day Configuration Menu.

CONNECTION MAPS MANAGER MENU

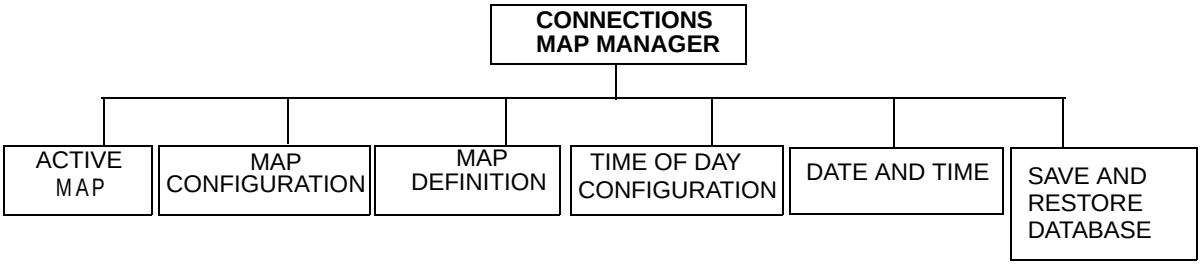
Before You Begin

Make sure you are familiar with the screen navigation commands described in Chapter 2.

To list the screen navigation commands press the **?** key.

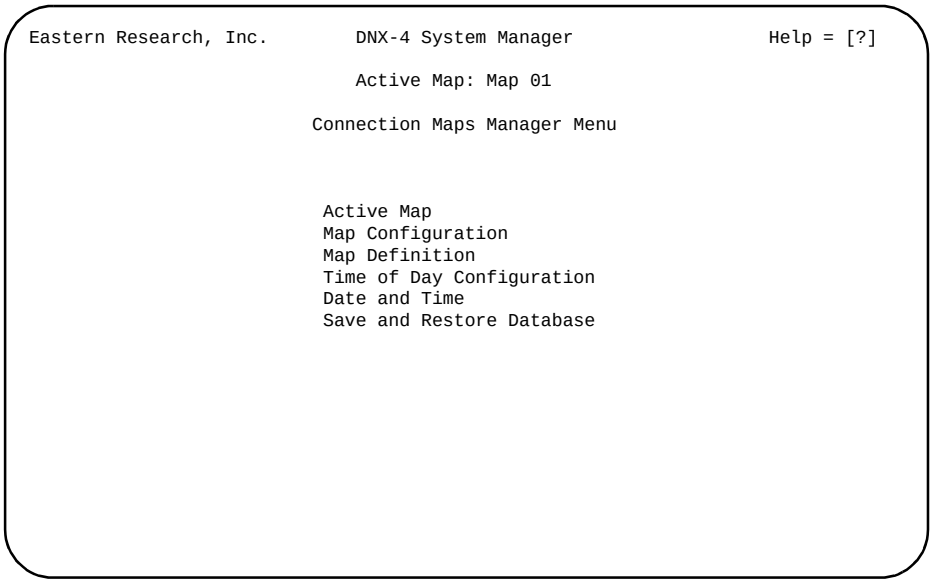
Reminder: To activate the values that you enter or select on the configuration screens, you must exit the screen. Diagnostic parameters are activated immediately, as soon as you change the value on the screen.

Connection Maps Manager Menu Structure



Connection Maps Manager Menu (cont.)

To access the Connection Maps Manager menu, from the DNX Main Menu, select Connections Maps Configuration.



4-3. Connection Maps Manager Menu.

Connection Maps Manager Menu Options

There are six choices on this menu:

Menu Option	Function
Active Map	Displays active map. From here, you can change the contents of the active map.
Map Configuration	Lists all maps. Provides “Active Map” and “Copy Map” functions. Select a map to display or change its contents.
Map Definition	Enables you to assign a name and brief description to a map.
Time and Day Configuration	Enables you to schedule maps for activation.
Date and Time	Set or verify current date and time.*
Save and Restore Database	Save/Restore database from host PC or workstation.*

**Also available from System Configuration Menu.*

CREATING AND ACTIVATING CONNECTION MAPS

Map Activities

The following outlines the tasks that you may complete to create and activate a map. You may complete some or all of these activities. These tasks are described in this chapter.

Activity
Assign a name and description to a map
Copy an existing map and use as the basis for a new map
Add, change, or delete connections in the map
Set up and run tests on connections
Activate the map immediately or schedule the map to be activated
Back up data to the host PC or workstation

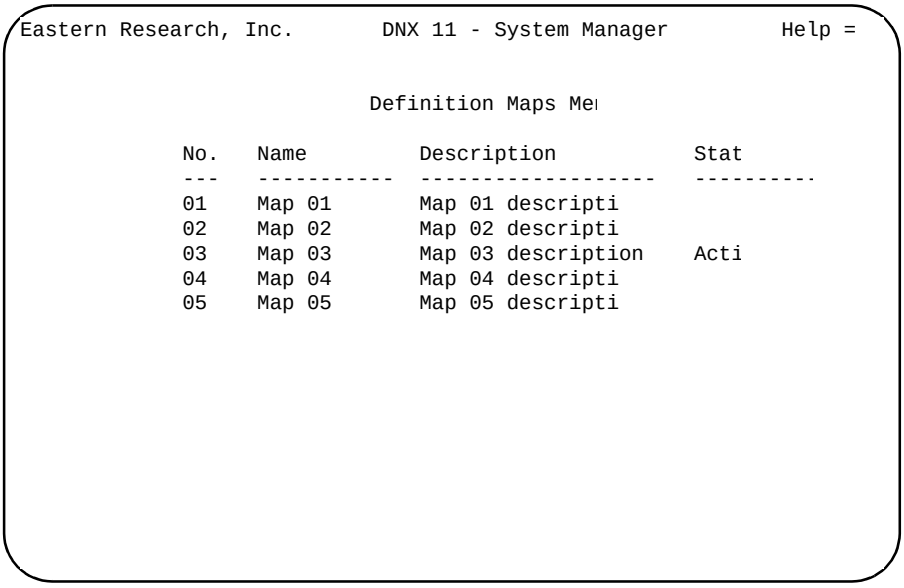
Assigning A Map Name And Description

You can assign a Name and Description to each of the five connection maps. The Status field is read-only.

Procedure

To assign a name and description to a map:

1. From the DNX Main Menu, select Connection Maps Manager Menu. Place your cursor on the Connection Maps Manager field and press **<Enter>**.
2. Then place your cursor on the Map Definition field and press <**Enter**>.


Eastern Research, Inc. DNX 11 - System Manager Help =
Definition Maps Me
No. Name Description Stat
--- ----------- ------------------- ----------
01 Map 01 Map 01 descripti
02 Map 02 Map 02 descripti
03 Map 03 Map 03 description Acti
04 Map 04 Map 04 descripti
05 Map 05 Map 05 descripti

4-4. Map Definition Menu.

2. Select the Map No. and press **<Enter>**.
3. Modify the Map Name and Description fields.

Reminder: Press **<Enter>** before typing.

4. Type **X**. Changes are saved and you return to the Connection Maps Manager Menu.

ACTIVATING A MAP

Description A map can be activated immediately. By default Map 01 is the active map.

Procedure To activate a map:

1. From the DNX Main Menu, select Connection Maps Manager Menu. Place your cursor on the Connections Maps Manager field and press **<Enter>**.
2. Then place your cursor on the Map Configuration field and press **<Enter>**. The following menu appears.

```
Eastern Research, Inc.        DNX-4 System Manager            Help = [?]


                          Configuration Maps Menu

             No.   Name         Description           Status
             ---   -----------  -------------------   ------------
             01    Map 01       Map 01 description    Active
             02    Map 02       Map 02 description
             03    Map 03       Map 03 description
             04    Map 04       Map 04 description
             05    Map 05       Map 05 description









[A]ctivate map      [T]ag map for copy      [C]opy to all tagged maps
```

4-5. Map Configuration Menu.

2. Move the cursor to the map to be activated. Type **A**.
3. Note that the Status entry for the map changes to Active. There can only be one active map at any time.

DISPLAYING A MAP

Description

You can display and work on the Active Map or any of the standby maps.

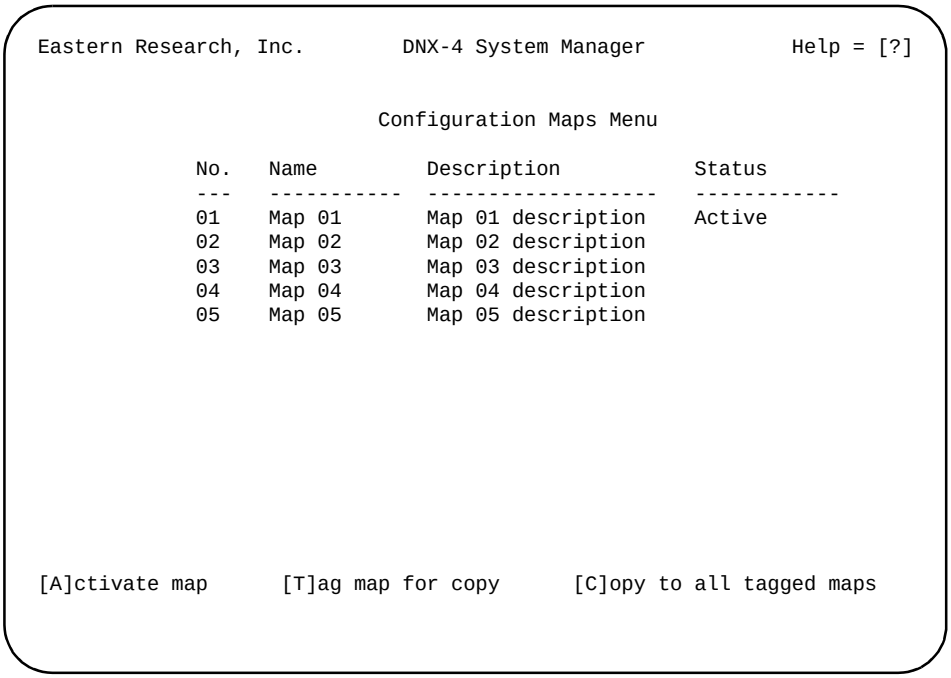
Displaying the Active Map

To display the active map, from the DNX Main Menu, select Connection Maps Manager Menu, then select Active Map. You can also display the active map using the following procedure.

Displaying Any Map

To display any map:

1. From the DNX Main Menu, select Connection Maps Manager Menu. Place your cursor on the Connections Map Manager field and press **<Enter>**.
2. Then place your cursor on the Map Configuration field and press **<Enter>**. The following menu appears.


Eastern Research, Inc.
DNX-4 System Manager
Help = [?]
Configuration Maps Menu
No. Name Description Status
01 Map 01 Map 01 description Active
02 Map 02 Map 02 description
03 Map 03 Map 03 description
04 Map 04 Map 04 description
05 Map 05 Map 05 description
[A]ctivate map
[T]ag map for copy
[C]opy to all tagged maps

4-6. Maps Configuration Menu.

3. Select the Map No. and press **<Enter>**. The following menu appears.

```
Eastern Research, Inc.        DNX-4 System Manager            Help = [?]

                   Map Configuration:   Map 01
Note: You must exit this menu in order to update the switch map

Name                 Src      Dest   Speed Type  Active Test Tester Port
-------------------------------------------------------------------------
QHS 3.1 TO QHS 3.2  03.01.01  03.02.01 0056k D  FDX
QHS 3.3 TO QHS 3.4  03.03.01  03.04.01 0056k D  FDX
QT1 4.1 TO QT1 4.2  04.01.01  04.02.01 0056k D  FDX
QT1 4.3 TO QT1 4.4  04.03.01  04.04.01 0056k D  FDX
--
--
--
--
--
--
--
--

Connection Filter: Not Active

[F]ilter                    [A]dd/[L]isten/[D]elete connection
[T]est set up/[R]estore     [H]ome/[E]nd/[N]ext/[P]rev page
```

4-7. Map Configuration.

MAP CONFIGURATION FIELD DESCRIPTIONS

Name: This field represents the 19-character connection name given by the user on the Add New Connection Screen.

Source (Src): This field represents the source slot, port and starting timeslot of a connection as entered on the Add New Connection Screen.

Destination (Dest): This field represents the destination slot, port and starting timeslot of a connection as entered on the Add New Connection Screen.

Speed: This field represents the T1 transmission speed as selected on the Add New Connection Screen.

Type: This field shows the type of traffic being connected (either data or voice) as well as the type of connection. The connection types are listed below:

- BRC (Broadcast Connection)
- BRM (Broadcast Master)
- FDX (Full-Duplex)

Active Test: This field identifies the active test as one of the following:

- Monitor-Src
- Monitor-Dest
- Split- Src
- Split-Dest

where Src = Source and Dest = Destination

Tester Port: This field defines the port (address) where the test will be run. The tester address will be shown as a four digit number separated by a decimal point, i.e., 01.02, where the first two digits represent the slot number and the last two digits represent the port number.

MAP COMMANDS

Actions Available Use the following commands in a map:

Command	Description
F	Filter: use to create connection filters for the map display. Only connections that match the filter criteria are displayed. To see all connections, make sure Filter Id is set to **none**.
A	Add: use to add a new cross-connection to a map
L	Listen: use to listen to a cross-connection
D	Delete: use to delete a cross-connection
T	Test: use to set up and run a test
R	Restore: use to end a test
H, E, N, P	Use to navigate through the list of cross-connections in the map

NOTE: You must exit the Active Map menu in order to update the edited map.

CONNECTION FILTERS

Description

You can specify a connection filter so that only connections that match the filter criteria are displayed in the maps. For example, if you specify a slot number, only cross-connections that use that slot number are displayed in the map.

NOTE **When you specify a connection filter, the filter is active for all maps and will stay activated until it is turned off.**

Procedure

To set up a filter:

1. Display a map.
2. Type **F**.

```
Eastern Research, Inc.        DNX-4 System Manager          Help = [?]


                       Connection Filter Configuration
                       -------------------------------
                           Filter Id........: None
                           Connection Name..:
                           Slot Number......: 0
                           Port Number......: 0
                           TimeSlot Number..: 0
```

4-8. Connection Filter Configuration.

3. Specify one or more filter criteria.
4. To save changes, type **X**.
5. When prompted: “Update Configuration? Are you sure (Y/N)?” Type **Y**. Exit the previous menu.

CONNECTION FILTERS FIELDS

Filter Id: (Option field) Select one of the following: None, By Connection Name, By Slot, By Slot/Port, Starting Slot/Port/Timeslot, By Data, By Voice.

Connection Name: (Text field) Enter up to 19 alphanumeric characters. Wildcard (*) can be used. For example, to limit the display to all connections that have connection names that begin with src, enter src*.

Slot number: (Option field) Select a port number.

Timeslot number: (Option field) Select a timeslot number.

ADDING A NEW CONNECTION

Description

To add a new cross-connection to a map, you specify the source and destination. If the timeslots you specify are already filled, the DNX will automatically assign available timeslots. You have the option to display the new timeslot allocation and make changes, if necessary.

Procedure

To add a new connection to a map:

1. Display a map.
2. Type **A**.

```
Eastern Research, Inc.        DNX-4 System Manager                Help = [?]

                          Add New Connection Screen

Connection name:                        Type...........: Full-Duplex

Src slot.......:                        Dest slot.......:
Src port.......: 01                     Dest port.......: 01
Starting Src Ts: 01                     Starting Dest Ts: 01
Speed..........: 56K      (1 DS0)       Voice/Data......: Data

Ts Allocation  : Auto-Consecutive









[S]ave connection
```

4-9. Add A New Connection Screen.

3. Identify the characteristics of the connection. See “Connection Fields” for details.
4. When done type **S** or **X** to save the connection information.
5. You are prompted: “View timeslot allocation? Are you sure? (Y/N)”.
6. Type **Y** to display the timeslot allocation. Go on to step 7. If you type **N**, the timeslot allocation is not displayed, however the new connection is still made. **You are done.** You remain on the *Add New Connection* screen.

Procedure (cont.)

```
Eastern Research, Inc.        DNX-4 System Manager           Help = [?]

                            Change Connection screen

Connection name: QT1 4.1 TO QT1 4.3     Type.........: Full-Duplex
Src slot.port  : 04.01 Quad T-1         Dest slot.port: 04.03 Quad T-1
Speed.........: 56K      (1 DS0)        Data/Voice....: Data
-------------------------------------------------------------------------
------
Src Port Time slot assignments          Dest Port Time slot assignments
01 QT1 4.1  12 .         23 .           01 QT1 4.1  12 .        23 .
02 .        13 .         24 .           02 .        13 .        24 .
03 .        14 .                        03 .        14 .
04 .        15 .                        04 .        15 .
05 .        16 .                        05 .        16 .
06 .        17 .                        06 .        17 .
07 .        18 .                        07 .        18 .
08 .        19 .                        08 .        19 .
09 .        20 .                        09 .        20 .
10 .        21 .                        10 .        21 .
11 .        22 .                        11 .        22 .


[V]iew all connections      [C]lear connection timeslots
```

4-10. Change Connection Screen.

The new cross-connection is displayed. Timeslots that contain an asterisk **(*)** are assigned.

From the Change Connection screen, you can do the following:

- To display all connections, type **V**.
- To reassign timeslots to the new connection:

  a. First, clear the new connection by typing **C**. Both sides of the new connection will be cleared from the screen.

  b. Move cursor to the new source timeslot and press **<Enter>**.

  c. Move cursor to the new destination timeslot and press **<Enter>.**

7. To save changes, type **X**.
8. When prompted: “Update Configuration? Are you sure (Y/N?)” Type **Y.**
9. Type **X** to return to the Configuration Map Menu.

CONNECTION FIELD DESCRIPTIONS

Connection Name: (Text field) This field is used to enter a name for the connection you are configuring. Any name up to 19 characters in length may be entered.

Type: (Option field) This field is used to select one of three types of connections:

- ***Full-Duplex*** - In full-duplex connections, data flows in two directions.
- ***Broadcast Connection*** - Broadcast connections declare a source and destination. Data flows from the source to the destination.
- ***Broadcast Master*** - Broadcast Master transmits only; there is no destination.

Source Slot and Port: (Option field) These fields are used to select the source slot and source port for the connection. The port always defaults to 01. You can allocate the slot number.

Starting Source Timeslot: (Option field) This field is used to select the starting source timeslot number (DS0) for automatic timeslot allocation.

Speed: A T1 digital transmission facility carries twenty- four 64 Kbps (DS0) “channels,” for a total of 1.536 Mbps (plus 8K overhead to achieve the well-known 1.544 Mbps). These DS0s can be assigned to specific connectors on the equipment to transport computer and /or voice information. In some cases, the user has access to the full 64 Kbps per channel while, in other cases, the user is limited to 56 Kbps per channel.

Before entering a value, the user must first determine if each DS0 will carry 56 Kbps or 64 Kbps of user data and then determine the correct quantity of DS0s necessary to achieve the desired data rate.

If the “Density” parameter is “Clear” on the Configuration screen, the 56/64 decision is completely user optional and “64 Kbps” is recommended to obtain maximum data transfer efficiency in the network. If “clear” is not chosen for the “density” parameter, steps must be taken to ensure proper “ones density” in the data presented to the network. If this is not done, the DNX may occasionally change the user data in order to satisfy network requirements.

There are three methods that can be used to ensure ones density in the data:

Limit the user data to 56 Kbps per DS0. The DNX will use the remaining 8 Kbps (in each DS0) to provide the required density.

Allow 64 Kbps user data in each DS0 and use alternate DS0s. Keep the intervening DS0s idle to provide the density. See DS0 Order below. This method wastes significant bandwidth and should only be used when absolutely necessary.

Allow 64 Kbps user data in each DS0 when the user’s protocol provides the required density. When the 56/64 decision has been made, choose the desired data rate. The correct DS0 quantity is displayed on the right side of the selection.

CAUTION: **In some cases, the same data rate can be achieved with two different DS0 quantities, one with 56 Kbps DS0s and the other with 64 Kbps DS0s.**

CONNECTION FIELD DESCRIPTIONS (CONT.)

Destination Slot and Port (Dest slot and Dest port): These fields are used to select the destination slot and destination port for the connection. The port always defaults to 01. You can allocate the slot number.

Starting Destination Timeslot (Starting Dest Ts): This field is used to select the starting destination timeslot number (DS0) for automatic timeslot allocation.

Voice/Data: This field is used to select the type of traffic being connected (either voice or data).

Timeslot Allocation (Ts Allocations): This field is used to determine how the timeslots will be allocated. The choices are **Auto-Consecutive**, **Alternate** and **Manual**.

- When ***Auto-Consecutive*** is selected, the DNX will automatically allocate timeslots in consecutive order, beginning with the starting source/destination timeslot.
- When ***Alternate*** is selected, the DNX will allocate timeslots alternately, beginning with the starting source/destination timeslot.
- When ***Manual*** is selected, there are no automatic allocation of timeslots.

Timeslot Allocation Conflicts: If there are no more timeslots available, the user will be notified by a pop-up window.

CHANGING AN EXISTING CONNECTION

Description

This screen is used for two purposes: to re-assign timeslots and to change the speed. All other parameters are read-only.

Procedure

To re-assign timeslots or to change the speed for an existing connection:

1. Display a map.
2. Move the cursor to the connection to be changed and press **<Enter>**.

```
Eastern Research, Inc.        DNX-4 System Manager           Help = [?]

                            Change Connection screen

Connection name: QT1 4.1 TO QT1 4.3     Type.........: Full-Duplex
Src slot.port  : 04.01 Quad T-1         Dest slot.port: 04.03 Quad T-1
Speed.........: 56K      (1 DS0)        Data/Voice....: Data
------------------------------------------------------------------------
------
Src Port Time slot assignments          Dest Port Time slot assignments
01 QT1 4.1  12 .         23 .           01 QT1 4.1  12 .        23 .
02 .        13 .         24 .           02 .        13 .        24 .
03 .        14 .                        03 .        14 .
04 .        15 .                        04 .        15 .
05 .        16 .                        05 .        16 .
06 .        17 .                        06 .        17 .
07 .        18 .                        07 .        18 .
08 .        19 .                        08 .        19 .
09 .        20 .                        09 .        20 .
10 .        21 .                        10 .        21 .
11 .        22 .                        11 .        22 .


[V]iew all connections      [C]lear connection timeslots
```

4-11. Change Connection Screen.

3. To display all connections type **V**.
4. If needed, change the Speed for the connection.
5. To reassign a Timeslot assignment:

   a. First, clear the connection. Move the cursor to the Src or Dest Port time slot assignment and type **C**. Both sides of the connection will be cleared from the screen.

   b. Move cursor to the new Source Timeslot and press **<Enter>**.

6. To save changes, type **X**.
7. When prompted: “Update Configuration? Are you sure (Y/N)?” Type **Y**.
8. Type **X** to return to the Configuration Map Menu.

TESTING A CONNECTION

Description Use this procedure to select a test type and to define the address (slot and port) where the test will be run. All other parameters are read-only.

Procedure To test a connection:

1. Display a map.
2. To test a connection, move the cursor to the Name where the connection is located and press **T**.

```
Eastern Research, Inc.        DNX-4 System Manager           Help = [?]

                  **** Test Connection screen ******

Connection name: QT1 4.1 TO QT1 4.3     Type.........: Full-Duplex
Src slot.port  : 04.01 Quad T-1         Dest slot.port: 04.03 Quad T-1
Speed.........: 56K      (1 DS0)        Data/Voice....: Data
===== Test id..: None                   TESTER slot.port:    .
Src Port Time slot assignments          Dest Port Time slot assignments
01 QT1 4.1  12 .         23 .           01 QT1 4.1  12 .        23 .
02 .        13 .         24 .           02 .        13 .        24 .
03 .        14 .                        03 .        14 .
04 .        15 .                        04 .        15 .
05 .        16 .                        05 .        16 .
06 .        17 .                        06 .        17 .
07 .        18 .                        07 .        18 .
08 .        19 .                        08 .        19 .
09 .        20 .                        09 .        20 .
10 .        21 .                        10 .        21 .
11 .        22 .                        11 .        22 .
```

4-12. Test Connection Screen.

3. Specify the type of test in the Test Id field.
4. Specify where the test will be run in the **TESTER slot port** field.
5. To save changes and exit to the Active Map menu, type **X** and confirm action when prompted by typing **Y**.
6. To restore a connection that has been put under test, on the Map Configuration screen, move the cursor to the Name where the connection is located and press **R**.

TEST CONNECTION FIELD DESCRIPTIONS

Test Id: This field is used to select one of four possible tests:

- Monitor- Src
- Monitor - Dest
- Split - Src
- Split- Dest

where Src = Source and Dest = Destination

TESTER slotport: This field is used to define the address (slot and port) where the test will be run. The tester address is written as a four digit number separated by a decimal point, i.e., 01.02, where the first two digits represent the slot number and the last two digits represent the port number.

LISTENING TO A CONNECTION

Description Use this procedure to listen to a connection.

Procedure To listen:

1. Display a map.
2. Locate the cursor on a Broadcast Master connection and type **L**.

```
Eastern Research, Inc.       DNX System Manager            Help = [?]

                          Add New Connection Screen

Connection name:                        Type...........: Listen-only
Src Connection: BrdMaster-1
Src slot.......: 03                      Dest slot.......:
Src port.......: 02                      Dest port.......:
Starting Src Ts: 01                      Starting Dest Ts:
Speed..........: 56K      (1 DS0)        Voice/Data......:

Ts Allocation  : Auto-Consecutive









[S]ave connection
```

4-13. Add A New Connection Screen (Listen-only).

3. Identify the destination. See “Connection Fields” for details.
4. When done, type **S** or **X** to save the connection information.
5. View the timeslot allocation. Make changes and save, if needed. See “Changing a Connection” for details.
6. Type **X** to return to the Configuration Map Menu.
7. To add more destinations that listen to a Broadcast Master, repeat steps 2 through 6.

COPYING A MAP

Description

You can create one or more copies of a map. You may want to copy a map and use it as a basis for a new map.

NOTE: You cannot copy a map into an Active Map.

Procedure

To copy a map:

1. From the DNX Main Menu, select Connection Map Manager, then select Map Configuration.
2. Move the cursor to the map that will become the copy and type **T**. You can tag one or more maps to become copies. An asterisk appears next to the maps that have been tagged. **Reminder:** Us the **SPACEBAR** or **BACKSPACE** or **arrow keys** to move up and down the list of maps.
3. Move the cursor to the map that will be used as the source and type **C**.
4. Confirm the copy action. The DNX displays: “Copy map X to the tagged maps? Are you sure (Y/N)?” When the copy completes, the message “Mapfile copy completed” appears. Press ***any key*** to continue.
5. If you want to make changes to one of the copies, move the cursor to the map and press **<Enter>.**

NOTE: Only one map can be active at any time.

SCHEDULING MAPS

Description

You can create a schedule for the week that includes:

- when a map is to be activated
- the Map Name

Each day can include up to five entries.

Related Tasks

To activate a map manually, refer to the section “Activating a Map”.

Procedure

To configure the time of day manager:

1. From the DNX Main Menu, select Configuration Maps Manager, then select Time of Day Configuration Menu.

```
Eastern Research, Inc.        DNX-4 System Manager            Help = [?]
                          Wednesday , November 11 15:58
Time Of Day Configuration Manager Enabled:No     ActiveMap:Map 01

|  Sun  |  Mon  | Tues  |Wednes | Thurs |  Fri  |Sat    |
|-------|-------|-------|-------|-------|-------|-------|
| 00:00 | 00:00 | 00:00 | 00:00 | 00:00 | 00:00 |0:00   |
|...    |...    |...    |...    |...    |...    |...    |
|-------|-------|-------|-------|-------|-------|-------|
| 00:00 | 00:00 |00:00  | 00:00 | 00:00 |00:00  |00:00  |
|...    |...    |...    |...    |...    |...    |...    |
|-------|-------|-------|-------|-------|-------|-------|
| 00:00 | 00:00 | 00:00 |00:00  |00:00  |00:00  |00:00  |
|...    |...    |...    |...    |...    |...    |...    |
|-------|-------|-------|-------|-------|-------|-------|
| 00:00 | 00:00 | 00:00 | 00:00 | 00:00 |00:00  |00:00  |
|...    |...    |...    |...    |...    |...    |...    |
|-------|-------|-------|-------|-------|-------|-------|
|00:00  | 00:00 | 00:00 | 00:00 | 00:00 | 00:00 | 00:00 |
|...    |...    |...    |...    |...    |...    |...    |
|-------|-------|-------|-------|-------|-------|-------|
```

4-14. Time and Day Configuration Menu.

2. Check the day, date and time appearing at the top of this screen. If it does not match the current day, date and time, go to the Date and Time menu and correct it immediately. Otherwise, your maps may be activated at the wrong times. See “Setting the Date and Time“ for details.
3. For each day, there are five blocks. To schedule a map for activation, enter the time using 24-hour notation and the Map Name.
4. To save changes, type **X**.
5. When prompted: “Update Configuration? Are you sure (Y/N)?” Type **Y**.

SCHEDULING MAPS FIELD DESCRIPTIONS

Active Map: This is a read-only field. It shows which map, if any, is currently active.

Enabled: Indicated if the time of day configuration feature has been enabled. If *"Yes,"* the connection maps will be activated at the pre-set times. If *"No,"* the schedule is blank. If the Time of Day feature is enabled, the new configuration will take effect as soon as this configuration is completed.

Day Entries (00:00): (Option field) Select the time when the map is to be activated. Select hours and minutes. 24-hour notation is used.

Map Name (...): (Option field) Select the name of the map to be activated.

```
Eastern Research, Inc.      DNX System Manager            Help = [?]
                          Wednesday , November 11 15:58
Time Of Day Configuration Manager Enabled:Yes    ActiveMap:Map 01

|  Sun  |  Mon  | Tues  |Wednes | Thurs |  Fri  |Sat    |
|-------|-------|-------|-------|-------|-------|-------|
| 06:00 | 06:00 | 06:00 | 06:00 | 06:00 | 06:00 |06:00  |
|Daily  |Daily  |Daily  |Daily  |Daily  |Daily  |Daily  |
|-------|-------|-------|-------|-------|-------|-------|
| 20:00 | 20:00 |10:00  | 20:00 | 20:00 |20:00  |20:00  |
|Night  |Night  |Special|Night  |Night  |Night  |Night  |
|-------|-------|-------|-------|-------|-------|-------|
| 00:00 | 00:00 | 12:00 |00:00  |00:00  |00:00  |00:00  |
|...    |...    |Daily  |...    |...    |...    |...    |
|-------|-------|-------|-------|-------|-------|-------|
| 00:00 | 00:00 | 20:00 | 00:00 | 00:00 |00:00  |00:00  |
|...    |...    |Night  |...    |...    |...    |...    |
|-------|-------|-------|-------|-------|-------|-------|
|00:00  | 00:00 | 00:00 | 00:00 | 00:00 | 00:00 | 00:00 |
|...    |...    |...    |...    |...    |...    |...    |
|-------|-------|-------|-------|-------|-------|-------|
```

4-15. Sample Schedule screen.

SETTING THE CURRENT TIME AND DATE

Description Make sure the system date and time are set correctly to ensure that scheduled maps execute at the correct times.

NOTE: For convenience, the Date and Time option can be set from either the Connections Map Menu or the System Configuration Menu.

Procedure To change the date and time settings:

1. From the Main Menu, select Connection Maps Manager. Place your cursor on the Connection Maps Manager and press **<Enter>**.
2. Then place your cursor on the Date and Time field and press **<Enter>**. The following screen appears.

```
Eastern Research, Inc.        DNX-4 System Manager              Help = [?]


                               Date and Time Menu


                              Month.....: November
                              Day.......: 11
                              Year......: 1998
                              Hour......: 16
                              Minute....: 50
                              Second....: 17
                              Day.......: Wednesday
```

4-16. Date and Time Menu.

3. Scroll through the options for each field until the correct values display on the screen.

Reminder: Press **<Enter>** to scroll forward through the options or type **B** to scroll back. Press **SPACE**, **BACKSPACE**, or use the **arrow keys** to move between fields.

4. Type **X.** To confirm action when prompted, type **Y**. Changes are saved and you return to the previous menu.

TIME AND DATE FIELD DESCRIPTIONS

Month: options are January through December.

Day: options are 1 through 31.

Year: default is 1998. Change to current year. The DNX is year 2000 compliant

Hour options are 1-24.

Minute: options are 0 through 59.

Day of Week: options are Sunday through Saturday.

SAVE AND RESTORE DATABASE

Description

The DNX system provides the capability to save the system configuration database as a software file and to restore the system configuration from previously saved software files.

Since the system configuration is software-based, standard protocols like TFTP can be utilized to transfer the system configuration database to a remote host (PC or workstation). Conversely, files that have been uploaded to a remote host for archival purposes can be downloaded to a DNX for disaster recovery or to facilitate system configuration on new installations.

NOTE: The Save/Restore Database function is also available from the System Manager Configuration Menu for convenience.

SAVING THE DNX'S CONFIGURATION DATA TO A HOST

Description

The ***SAVE*** operation gathers all of the files that exist on the DNX, compresses them, and then sends them to the host.

If you plan to save more than one DNX to the host, remember to enter a unique name for each file so that existing files do not get overwritten.

Procedure

To save the DNX's configuration to a host:

1. Create a directory on the host that will be used to store the DNX's configuration. Because the configuration consists of several files, a separate directory is required for each DNX.
2. Run the host's TFTP server.
3. From the DNX Main Menu, select System Configuration. Place your cursor on the System Configuration field and press **<Enter>**.
4. Then place your cursor on the Save/Restore Database field and press **<Enter>**. The following screen appears.

```
Eastern Research, Inc.        DNX-4 System Manager          Help = [?]


                          Save and Restore Database Menu


Host IP address.: 0.0.0.0
Host directory..:
Host file name..: dnxconf









[S]ave Database      [R]estore Database
```

4-17. Save and Restore Database Menu.

5. Enter the remote host's IP address and the directory on the host where this DNX's files are to be saved. Specify the file name for the file on the host. It is recommended that you change this name if you plan to save more than one DNX to the host.
6. Type **S** to execute the Save Database command and exit the menu.
7. Type **Y** at the confirmation screen. The progress of the transfer will appear on the screen. If there are any errors, correct the problem and perform the save again.

RESTORING THE DNX'S CONFIGURATION DATA FROM A HOST

Description

The ***RESTORE*** operation gathers the backup file from the host and restores the files on the DNX's System Manager Cards.

When you restore file names, the file name on the host will have a .b extension.

Procedure

To restore the DNX's configuration from a host:

1. Run the host's TFTP server.
2. From the DNX Main Menu, select System Configuration. Place your cursor on the System Configuration field and press **<Enter>**.
3. Then place your cursor on the Save/Restore Database field and press **<Enter>**. The following screen appears.

```
Eastern Research, Inc.     DNX System Manager          Help = [?]


                          Save and Restore Database Menu


Host IP address.: 193.222.333.444
Host directory..: d:\
Host file name..: hostconf
```

```
[S]ave Database      [R]estore Database
```

4-18. Save and Restore Database Menu.

4. The remote host's IP address and directory where this DNX's configuration was saved will appear in the proper fields. If incorrect, enter the correct information.
5. Type **R** to execute the Restore Database command and exit the menu.
6. Type **Y** at the confirmation screen. The progress of the transfer will appear on the screen. If there are any errors, correct the problem and perform the restore again. After the files have been transferred, the system will re-initialize itself with the restored configuration.

SAVE AND RESTORE DATABASE FIELD DESCRIPTIONS

Host IP Address: This field is used to specify the remote host's IP address. IP addresses are 32 bits long and written as four decimal digits separated by a period. Each digit represents 8 bits of the address. The range of each digit is from 0-255.

Enter an IP address in dotted decimal form. If you do not know the remote host's IP address, consult your network administrator.

Host Directory: This field is used to specify the directory on the remote host where the DNX's files are to be saved. Up to eight characters may be entered in this field.

Host File Name: The host file name, as shown in Figure 4-10, is the default name. It is strongly recommended that you change this name if you plan to save more than one DNX to the host. When you restore file names, the file name will have a .b extension. Up to eight characters may be entered in this field.

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5 Node Summary Menu

The Node Summary Menu provides access to all of the available application modules that you have purchased for your nest. Select this option when you want to change or display information about an individual application module installed in the DNX chassis.

Application Module Configuration

To initially configure, change or delete any of the application modules installed in the DNX, select Node Summary from the DNX Main Menu. The Node Summary Menu displays a summary of the modules physically located in each of the slots in your nest.

If an application module is not present in the equipment nest, you can not access the individual screens associated with it. The menus for each application module are derived from the actual application module.

```
Eastern Research, Inc.       DNX 4 - System Manager        Help = [?]
Standby SMC not present

                                Node Summary Menu

Slot#  Configured Type   Actual Type       Status
-----  ---------------   -----------       ------
01)    Quad T1           Quad T1           Alarm
02)    T3                ----              Not Present
03)    Quad OCU          Quad OCU          On
04)    Octal Voice       Octal Voice       On









SMCA)  System Manager                      Not Present
SMCB)  System Manager                      On Line


[C]hange slot configuration      [D]elete slot configuration
```

5-1. Node Summary Menu.

The Node Summary Menu above shows a listing of the 4 slots for the DNX-4 (DNX-11 will have 11 slots). The Node Summary lists:

- the type of module that has been defined for each slot (under the *Configured Type* heading)
- the actual module physically located in the slot (*Actual Type*)
- and the status of each module in the nest, including the System Manager Cards (SMCA and SMCB)

System Manager Cards - SMCA/SMCB

The DNX supports optional redundant System Manager Cards (SMCs).

The DNX-11 has two half-height slots positioned vertically on the left front side for the SMCs. The SMCA is located in the top slot and the SMCB is located in the bottom slot.

The DNX-4 has two half-height slots positioned horizontally on the top for the SMCs. The SMCA is located in the slot on the right side and SMCB is located in the slot on the left side.

If the system is used in a non-redundant mode, either slot can be populated. The Status field of the Node Summary Menu displays which slot is populated and which slot is not.

Node Summary Menu Actions

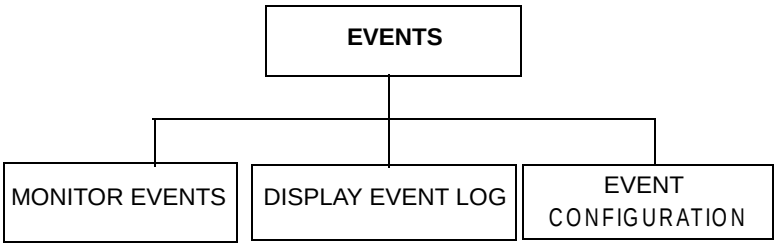
The following table lists the actions available on the Node Summary Menu.

Action	Key
Define the type of application module in a slot.	Move cursor to Slot# and type **C**. Pressing **"C"** causes the Configure Card Slot Menu to appear. The Configure Card Slot Menu, as shown and explained in Chapter 3, simply allows you to define the type of application module in the slot and to optionally name the slot.
Delete a slot configuration.	Move cursor to Slot# and type **D**.
Access the application module for configuration, diagnostics, or utilities options.	Move cursor to Slot# and press **Enter**. **NOTE:** The Main Menu for the slot/application module you select will appear only if that module is physically located in the slot.

6 System Events

The DNX constantly monitors for the occurrence of "events" such as alarms, test commands, and system resets. When an event occurs, it is given a sequence number and is time and date stamped. The slot associated with the event as well as a description of the event is recorded. The Events Menu provides access to three submenus. Refer to Chapter 2 for an explanation of the menu procedures.

Events Menu Structure



Events Menu Options The Events Menu has three options:

- ***Monitor Events*** enables you to see a running log of the events as they take place. You can also clear the event log from the system events screen.
- ***Display Event Log*** shows the most recent events, up and until the moment you requested to view the log. It will not "add" any events that may be occurring as you view the log. You *cannot* clear the log from this screen.
- ***Event Configuration*** enables you to dump the DNX's event log to a personal computer or workstation. You must, however, have the SysLog program running on your PC or workstation to perform this function.

NOTE: A *Help* menu is available by pressing the ? key.

MONITOR EVENTS

Description

You can monitor events as they take place on the DNX. Up to one screen of events can be displayed. Events are added to the top of the list as they occur.

Procedure

Use this procedure to monitor events on the DNX:

1. From the DNX Main Menu, select Events. Place your cursor on the Events field and press **<Enter>**.
2. Then place your cursor on the Monitor Events field and press **<Enter>**. The following screen appears.

```
Eastern Research, Inc.        DNX-4 System Manager            Help = [?]

                                 System Events

Seq  Time  Date  Slot  Event
---  ----  ----  ----  ------------------------------------------------
0048 17:02 11/11 SMCA  def >> Added user - one
0047 17:01 11/11 0003  Port 4 is In Service
0046 17:01 11/11 0003  Port 3 is In Service
0045 17:01 11/11 0003  Port 2 is In Service
0044 17:01 11/11 0003  Port 1 is In Service
0043 17:01 11/11 0003  QHS Reset
0042 17:01 11/11 SMCA  StatusServer: Frame Sync Pulse Failure - 1
Devices
0041 17:01 11/11 SMCA  StatusServer: Frame Sync Pulse Failure - 1
Devices
0040 17:01 11/11 SMCA  StatusServer: Frame Sync Pulse Failure - 1
Devices
0039 17:01 11/11 SMCA  StatusServer: Frame Sync Pulse Failure - 1
Devices
0038 17:01 11/11 SMCA  LOGIN user - DefaultUser (login total: 2)
0037 17:01 11/11 SMCA  LOGOUT user - DefaultUser (login remains: 1)
0036 17:00 11/11 SMCA  LOGIN user - DefaultUser (login total: 2)
0035 15:46 11/11 SMCA  LOGOUT user - DefaultUser (login remains: 1)
0034 15:36 11/11 SMCA  Card in slot 0004 present

[C]lear event log              >> indicates Audit Trail Event
```

6-1. System Events Menu.

3. To clear the Event Log, type **C** and confirm.
4. To exit the screen and return to the previous menu, press **Esc**.

DISPLAY EVENT LOG

Description

Display the Event Log to show the most recent events that have occurred on the DNX. Events will not be added to the Event Log while it is displayed.

Related Tasks

To clear the contents from the Event Log, select the Monitor Events option from the Events Menu. See “Monitoring Events” (in this chapter) for more information.

To send events to syslog on a remote host, see “Sending Events to a Remote Host.”

Procedure

To display Event Log:

1. From the Main Menu, select Events. Place your cursor on the Events field and press **<Enter>**.
2. Then place your cursor on the Event Log field and press **<Enter>**.
3. To exit the screen and return to the previous menu, press **Esc**.

```
Seq  Time  Date  Slot  Event
---  ----  ----  ----  ------------------------------------------------
0048 17:02 11/11 SMCA  def >> Added user - one
0047 17:01 11/11 0003  Port 4 is In Service
0046 17:01 11/11 0003  Port 3 is In Service
0045 17:01 11/11 0003  Port 2 is In Service
0044 17:01 11/11 0003  Port 1 is In Service
0043 17:01 11/11 0003  QHS Reset
0042 17:01 11/11 SMCA  StatusServer: Frame Sync Pulse Failure - 1
Devices
0041 17:01 11/11 SMCA  StatusServer: Frame Sync Pulse Failure - 1
Devices
0040 17:01 11/11 SMCA  StatusServer: Frame Sync Pulse Failure - 1
Devices
0039 17:01 11/11 SMCA  StatusServer: Frame Sync Pulse Failure - 1
Devices
0038 17:01 11/11 SMCA  LOGIN user - DefaultUser (login total: 2)
0037 17:01 11/11 SMCA  LOGOUT user - DefaultUser (login remains: 1)
0036 17:00 11/11 SMCA  LOGIN user - DefaultUser (login total: 2)
0035 15:46 11/11 SMCA  LOGOUT user - DefaultUser (login remains: 1)
0034 15:36 11/11 SMCA  Card in slot 0004 present
0033 15:36 11/11 SMCA  Card in slot 0003 present
0032 15:36 11/11 0003  Port 4 is In Service
0031 15:36 11/11 0003  Port 3 is In Service
0030 15:36 11/11 0004  Port 4 is In Service
```

6-2. Event Log.

SENDING EVENTS TO A HOST PC OR WORKSTATION

Description

You can log events to syslog on a host PC or workstation so that you do not need to be logged into the DNX to receive event information. If you choose to log events to syslog, events will also be recorded in the DNX Event Log.

Before You Begin

You must have syslog installed on your PC or workstation.

Procedure

To send events to syslog on a remote host:

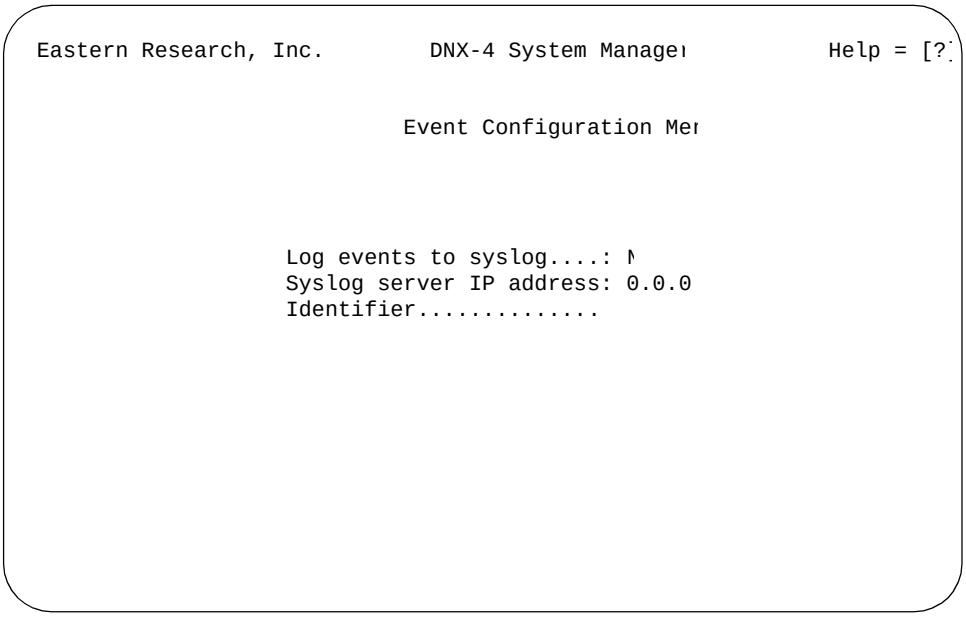
1. From the Main Menu, select Events. Place your cursor on the Events field and press **<Enter>**.
2. Then place your cursor on the Event Configuration field and press **<Enter>**.
3. To send log events to a remote host, select **Yes** in the **Log events to syslog** field. Specify the Syslog server IP address in dot notation and the identifier for the DNX.
4. Type **X** and confirm action when prompted, by typing **Y**. Changes are saved and you return to the previous menu.

Sending Events to a Host PC or Workstation Field Descriptions

Log events to syslog: Select **Yes** or **No** to send the event data to a host PC or workstation.

Syslog server IP Address: This is the host address where you want to send the event data.

Identifier: Identifies the specific DNX unit from which the information is being sent.



6-3. Event Configuration Menu.

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7 Utilities Parameters

CAUTION: ***Use caution when initiating Utilities Menu commands. Some of these commands may be service affecting and should only be performed by knowledgeable personnel.***

The Utilities Menu provides options that enable you to:

- run diagnostic utilities for debugging purposes
- copy the file system
- switchover System Manager Cards (SMCs)
- download software
- return the system to default settings

Before You Begin

Reminder: To activate the values that you enter or select on the configuration screens, you must exit the screen. Diagnostic parameters are activated immediately, as soon as you change the value on the screen.

Accessing the Utilities Menu

To access the Utilities menu, select Utilities from the DNX Main Menu. Place your cursor on the Utilities field and press **<Enter>**. The following menu appears.

```
Eastern Research, Inc.        DNX-4 System Manager          Help = [?]

                                  Utilities Menu


                              Copy File System
                              Switchover SMCs
                              MIB Table
                              Ping
                              IP Route Table
                              ARP Table
                              Return to Default Settings
                              Backplane Timeslots Display
                              Initialize SMC Rearcard Modem
                              File System Debug Counters
                              Download Devices Software
                              Reset All Channel Cards
```

7-1. Utilities Menu.

COPY FILES TO STANDBY SMC

Description

If you have two System Manager Cards, the DNX automatically copies files from the on-line SMC to the standby SMC periodically so that the two file systems are identical.

Use this procedure to manually copy the file system from the on-line SMC to the standby SMC. For example, you may want to copy the file system when you have made many changes and you want to update the standby SMC immediately.

By copying the configuration files from the on-line SMC to the standby SMC, you can help ensure that the DNX stays on-line. The standby System Manager is automatically switched in should the “on-line” unit fail, thereby restoring service and minimizing any outages.

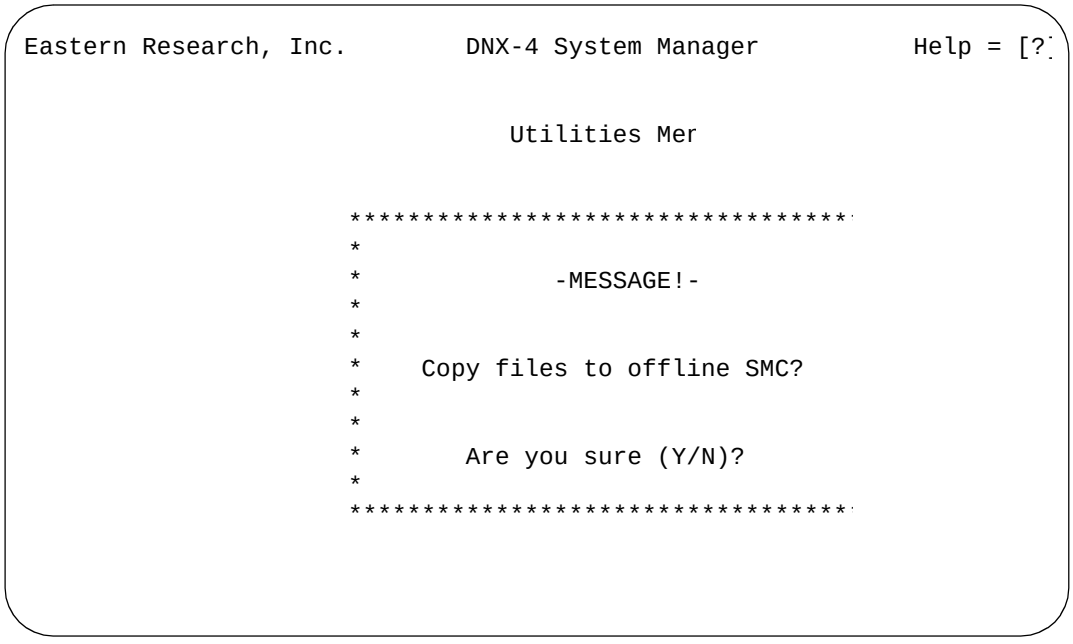
Related Tasks

To switch manually to the Standby System Manager Card, choose the Switchover SMCs options from the Utilities Menu.

Procedures

To copy the configuration files from the on-line SMC to the standby SMC:

1. From the DNX Main Menu, select Utilities. Place your cursor on the Utilities field and press **<Enter>**.
2. Then place your cursor on the Copy File System field and press **<Enter>**. This message displays: *Copy files to off-line SMC?*
3. Type **Y**. All configuration files are copied to the Standby Manager Card. When the configuration files have been copied, the Standby System Manager Card resets.



7-2. Copy File System Menu.

SWITCHOVER SMCS

Description

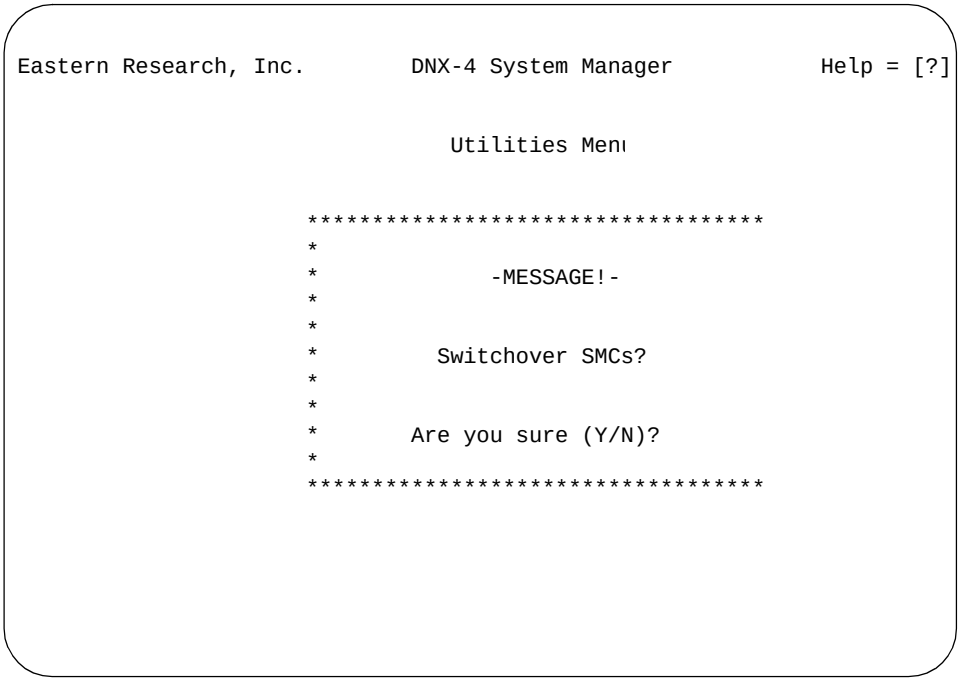
This procedure applies only if you have two SMCs in the DNX system.

The Standby SMC is automatically switched in should the “on-line” unit fail, thereby restoring service and minimizing any outages. You can also switch manually to the standby System Manager Card by selecting the Switchover SMCs option from the Utilities menu.

Procedure

To manually switch to the Standby SMC:

1. From the DNX Main Menu, select Utilities. Place your cursor on the Utilities field and press **<Enter>**.
2. Then place your cursor on the Switchover SMCs field and press **<Enter>**. This message displays: *Switchover SMCs?*



7-3. Switchover SMC Menu.

3. Type **Y**. The standby SMC goes “on-line” (*becomes active*), and the on-line System Manger Card goes “off-line” (*becomes inactive*).

MIB TABLE

Description

Use the MIB Table diagnostic utility to display read-only diagnostics of network activity. The MIB display is significant for those running IP traffic. The table displays the MIB-II parameters as defined in RFC1213.

Procedure

To access the MIB Table diagnostic utility:

1. From the DNX Main Menu, select Utilities. Place your cursor on the Utilities field and press **<Enter>**.
2. Then place your cursor on the MIB Table field and press **<Enter>**.
3. Press any key to display more of the MIB display.

```
MIB II display...
***** IP variables *****
ipInReceives...:    984439 ipInHdrError:         0 ipInAddrErrors:           0
ipForwDatagrams:         0 ipInDiscards:         0 ipInDelivers:        966199
ipUnknownProtos:         0 ipOutRequest:    216902 ipOutDiscard:             0
ipOutNoRoutes..:     36522 ipReasmOKs  :         0 ipReasmFails:             0
***** ICMP variables *****
icmpInMsgs.....:        13 icmpInErrors:         0 icmpInDestUnreac:        13
icmpInTimeExcds:         0 icmpInParmPr:         0 icmpInSrcQuenchs:         0
icmpInEchos....:         0 icmpInEchoRp:         0 icmpInTimestamps:         0
icmpInTstampRep:         0 icmpInAddrMa:         0 icmpInAddrMaskRe:         0
icmpOutMsgs....:     18261 icmpOutError:         0 icmpOutDestUnrea:     18261
icmpOutTimeExcd:         0 icmpOutParmP:         0 icmpOutSrcQuench:         0
icmpOutRedirect:         0 icmpOutEchos:         0 icmpOutEchoReps :         0
icmpOutTimestam:         0 icmpTimesRep:         0 icmpOutAddrMasks:         0
icmpOutAddrMaRe:         0
***** UDP variables *****
udpInDatagrams.:    965512 udpNoPorts  :         0 udpInErrors     :         0
udpOutDatagrams:    197949
Press any key to continue...
```

7-4. MIB Display.

PING

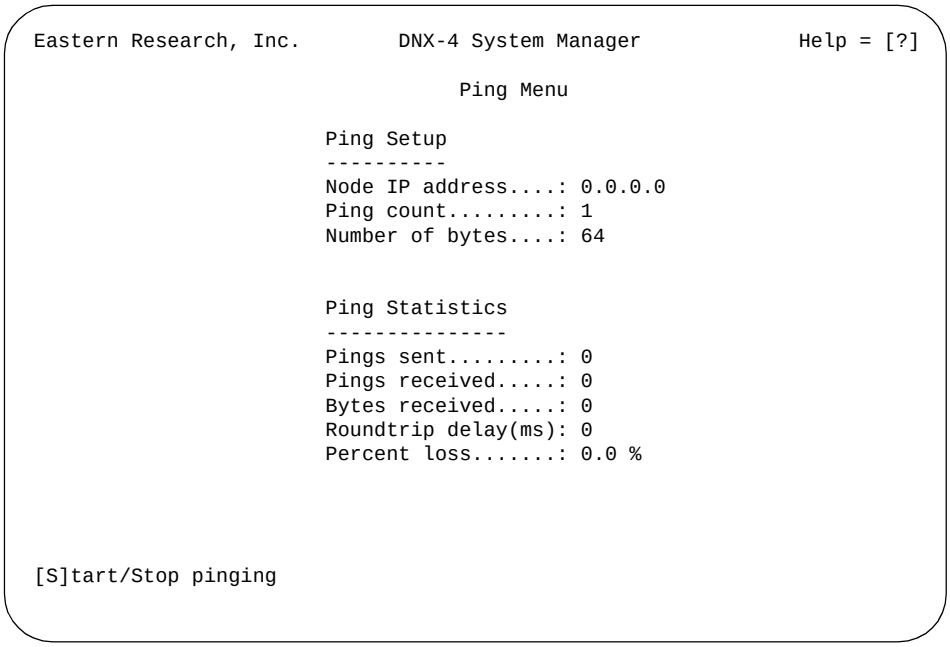
Description

The ping command enables you to see if a remote system is up and accessible by your host. The ping command sends a datagram to the remote system and waits for a response.

Procedure

To access the Ping diagnostic utility:

1. From the DNX Main Menu, select Utilities. Place your cursor on the Utilities field and press **<Enter>**.
2. Then place your cursor on the Ping field and press **<Enter>**.
3. Enter the node address, count and length, then type **S**. The unit responds with ping statistics. The screen will show the number of pings sent and received (echoed back) from the IP address, and the length of time, in milliseconds, that it took for the echo request message to be sent to the IP address and the echo reply message to be returned to the DNX System Manager. If the count is 0, the trip was accomplished in less than 10 ms.
4. Type **S** to stop ping.
5. Press **Esc** to return to the previous menu.



7-5. Ping Menu Display.

PING FIELD DESCRIPTIONS

Node IP Address: The IP address you want to PING. The address is entered in dotted decimal notation.

Ping Count: The number of times you want to ping the defined address.

Number of Bytes: The optional length (in bytes) of the ping message you plan to send. This is used to verify that the receiving end can receive a packet of the defined size.

IP ROUTE TABLE

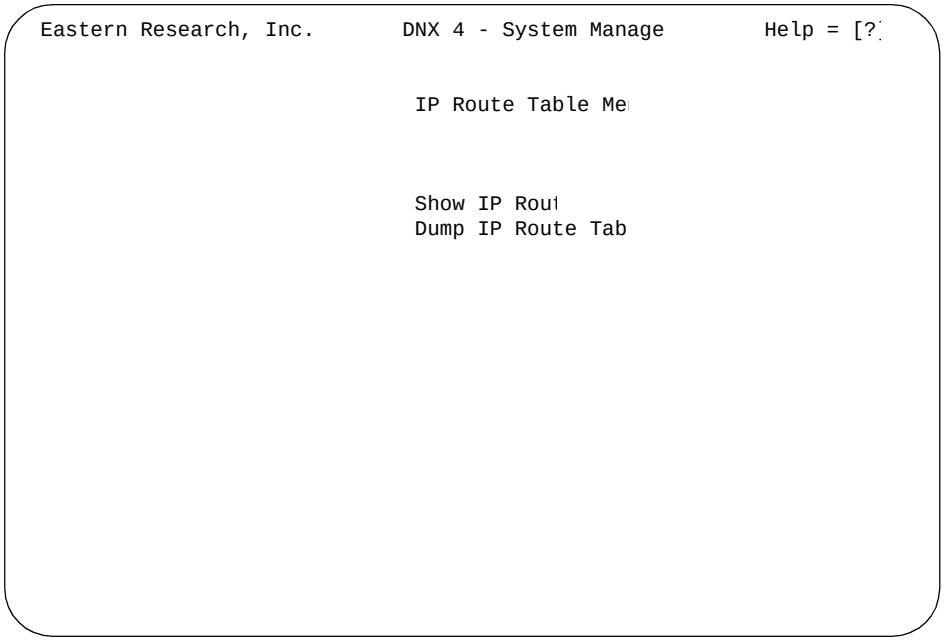
Description

The IP Route Table is used to route a datagram to the DNX that will send it to its next hop. Select Show IP route to show a specific route for an individual destination. Select Dump IP route table for a listing of every destination address and the route each takes.

Procedure

To access the IP Route Table diagnostic utility:

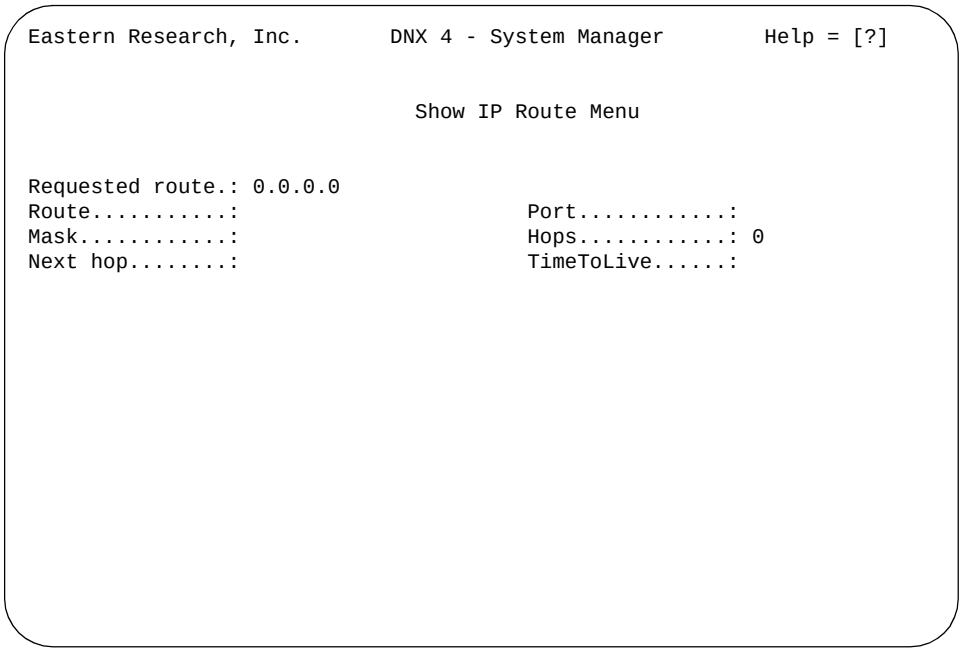
1. From the DNX Main Menu, select Utilities. Place your cursor on the Utilities screen and press **<Enter>**.
2. Then place your cursor on the IP Route Table field and press **<Enter>**. The following screen appears.



7-6. IP Route Table Menu.

Procedure (cont.)

3. If you select Show IP Route, enter the Requested route. **Requested route:** This field allows you to request routing information for a specific destination network address or a specific host address. Enter the requested route address in dotted decimal notation.



7-7. Show IP Route Menu.

Procedure (cont.)

4. If you select Dump IP Route, enter the Route/Address. **Route/Address:** This address is the destination network address or a specific host address. It is represented in “dotted decimal notation.” Each digit represents 8 bits of the address. The range of each digit is from 0-255.

```
IP route table display...

Address          Mask             Next Hop         Port     Hops
TimeToLive
-------          ----             --------         ----     ---- -------
---
200.0.0.128      255.255.255.255  Direct           Internal   0  Forever
200.0.0.252      255.255.255.255  Direct           Internal   0  Forever
200.0.0.253      255.255.255.255  Direct           Internal   0  Forever
200.0.0.122      255.255.255.255  Direct           Internal   0  Forever
200.0.0.0        255.255.255.0    Direct           1          0  180
207.124.164.37   255.255.255.255  Direct           Internal   0  Forever
207.124.164.0    255.255.255.0    Direct           0          0  180

Press any key to continue...
```

7-8. Dump IP Route.

IP Route Field Descriptions

Mask: This address is generated automatically and is represented in “dotted decimal notation.”

Next Hop: This is the IP address to which an IP frame is to be forwarded. The network portion matches the network portion of the DNX port. The next hop is represented in “dotted decimal notation.”

Port: This field identifies the port from which the datagram is sent. If it is set to 0, the port is a logical port. If it is set to “internal,” it represents the DNX address.

Hops: This field represents the number of hops required to reach the remote IP network. The range is from 0-15.

Time To Live: This count represents the amount of time (in seconds) that an address can remain inactive before it is deleted. If the field is set to “Forever,” the address will not be deleted; it has been entered manually and will not age.

ARP TABLE

Description

ARP stands for ***Address Resolution Protocol*** as defined by RFC826. ARP is used to obtain the physical layer address associated with the IP address. Mapping is created between the physical and IP addresses. The physical addresses are dynamically discovered.

Procedure

To access the ARP table diagnostic utility:

1. From the DNX Main Menu, select Utilities. Place your cursor on the Utilities field and press **<Enter>**.
2. Then place your cursor on the ARP Table field and press **<Enter>**.
3. Press any key to continue.

```
ARP table display..
Protocol Address    Hardware Address     State      TimeToLi
-------- ---------- ----------------     ---------  --------
192.168.210.5       00:20:54:30:01:35    Resolved    6
192.168.210.120     52:54:00:da:2e:57    Resolved    5
192.168.210.100     00:a0:24:a9:55:24    Resolved    5

Press any key to continue..
```

7-9. ARP Table Utility Display.

ARP Table Field Descriptions

Protocol Address: This is the IP address.

Hardware Address: This is the physical address associated with the IP address.

State: The State is either “pending” or “resolved”. If the DNX is in a “pending” state, the address has not been resolved; the DNX is waiting for an ARP reply message.

Time To Live: This count represents the amount of time (in seconds) that the address can remain inactive before it will be deleted. The maximum count is 10 minutes (600 seconds).

RETURN TO DEFAULT SETTINGS

Description

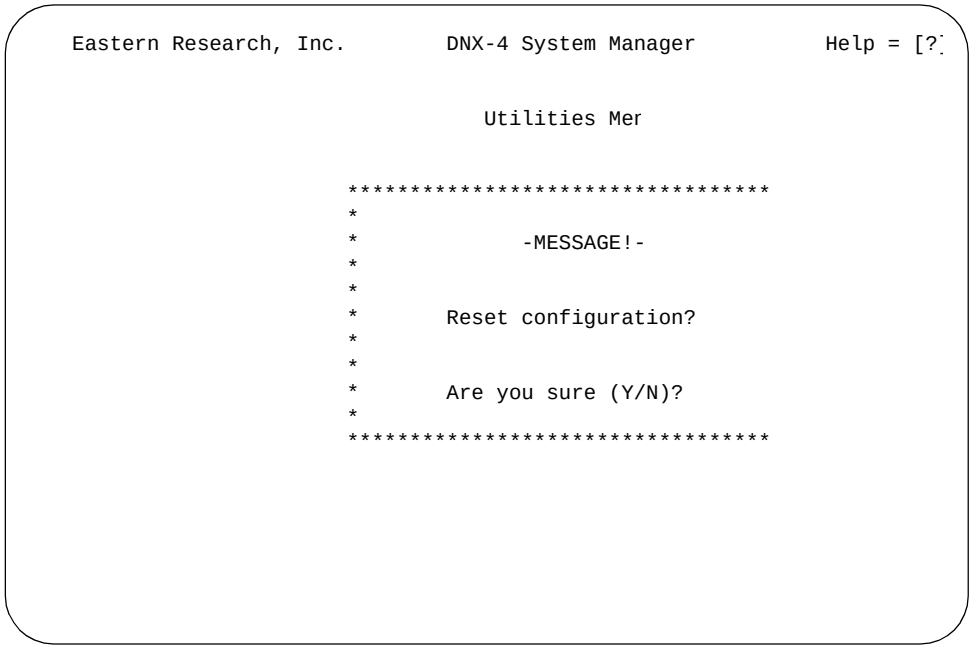
This option resets the system configuration. It erases the flash system, reformats and initializes the flash, and creates default configuration files. Any system configurations that may have been entered will be erased.

CAUTION: This command may be service affecting and should only be performed by knowledgeable personnel.

Procedure

To reset the system configuration to default settings:

1. From the DNX Main Menu, select Utilities. Place your cursor on the Utilities field and press **<Enter>**.
2. Then place your cursor on the Return to Default Settings field and press **<Enter>**. This message displays: *Reset configuration?*
3. Type **Y**. The system returns to the default settings.



7-10. Default Settings Display.

BACKPLANE TIMESLOTS DISPLAY

Description

The Backplane Timeslots Display is a read-only diagnostic utility which provides a detailed list of all of the configured connections in the system. Each connection is defined by its backplane timeslot number (BTS), connection ID number (Cid), physical slot (Sl), port (Po) and time slot assignment (Ts), and connection name. In addition, each connection is also given a “flag” which further defines the connection as a “write to” or “read-from” connection, as a “destination” or “source” connection, and as a “data” or “voice” connection. The flag also provides the tester slot and port as well as the buss associated with each connection.

The flag is defined as follows:

WDda#(00.00) where:
the first character is a capital W or R and: W = Write to Backplane R = Read from Backplane;
the second character is a capital D or S and: D = Destination S = Source;
the third character is a lower-case d or v and: d = data v = voice;
the fourth character is a lower-case a or b and: a = buss a b = buss b;
the fifth character is the number of bits (7 or 8);
the last characters (in parentheses) represent the tested slot and port numbers.

Procedure

To reset the system configuration to default settings:

1. From the DNX Main Menu, select Utilities. Place your cursor on the Utilities field and press **<Enter>**.
2. Then place your cursor on the Backplane Timeslots Display field and press **<Enter>**.
3. Press **<Enter>** to continue displaying backplane timeslots or press any other key to exit.

```
-----  DNX Backplane Timeslot Map Id = 3 Version =50 .----------
   ----  Bus A Bts Writers and Readers  Groups ----
 BTS  Cid   Sl Po Ts Flags         Connection Name
 0087 0002  01.03.01 WSda7(00.00)     QT1-1.3 TO QT1-1.1V
 0087 0002  01.01.01 RDda7(00.00)     QT1-1.3 TO QT1-1.1V
-----
 0088 0002  01.01.01 WDda7(00.00)     QT1-1.3 TO QT1-1.1V
 0088 0002  01.03.01 RSda7(00.00)     QT1-1.3 TO QT1-1.1V
-----
 0089 0002  01.03.03 WSda7(00.00)     QT1-1.3 TO QT1-1.1V
 0089 0002  01.01.03 RDda7(00.00)     QT1-1.3 TO QT1-1.1V
-----
 0090 0002  01.01.03 WDda7(00.00)     QT1-1.3 TO QT1-1.1V
 0090 0002  01.03.03 RSda7(00.00)     QT1-1.3 TO QT1-1.1V
-----
 0091 0002  01.03.05 WSda7(00.00)     QT1-1.3 TO QT1-1.1V
 0091 0002  01.01.05 RDda7(00.00)     QT1-1.3 TO QT1-1.1V
-----
 0092 0002  01.01.05 WDda7(00.00)     QT1-1.3 TO QT1-1.1V
 0092 0002  01.03.05 RSda7(00.00)     QT1-1.3 TO QT1-1.1V
-----

press <CR> to continue - any other key to exit.
```

7-11. Backplane Timeslots Display.

INITIALIZE SMC REAR CARD MODEM

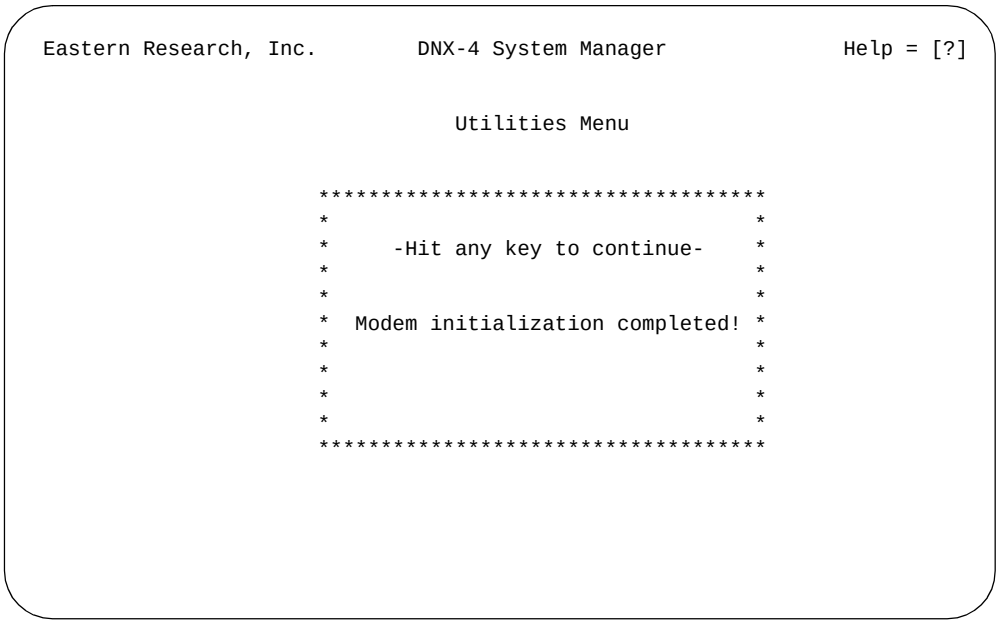
Description

The SMC has a built-in modem which can be used for technical support. You may want to initialize the modem when it is hung up and not responding.

Procedure

To the Initialize SMC rear card modem:

1. From the DNX Main Menu, select Utilities. Place your cursor on the Utilities field and press **<Enter>**.
2. Then place your cursor on the Initialize SMC Rear Card Modem field and press **<Enter>**. The command executes immediately and then displays the message: *Modem initialization completed!*



7-12. Initialize SMC Rear Card Modem.

FILE SYSTEM DEBUG COUNTERS

Description

The File System Debug Counters describe the file system on the SMC, keeps track of deleted files, and shows how much space is left.

Procedure

To display the System Debug Counters:

1. From the DNX Main Menu, select Utilities. Place your cursor on the Utilities field and press **<Enter>**.
2. Then place your cursor on the File System Debug Counters and press **<Enter>**.
3. Press any key to exit this screen and return to the previous menu.

```
    X2 File System Statistics and Debug Counters Men


Invalid Volume.............: 0     FDISK executed.............:
Garbage Collection.........: 0     Wipe Files.................:
Wipe Disk..................: 0     Open Files.................:
Number of Readers..........: 0     Number of Writers..........:
nDisk informatior
----------------
Volume Name..........: [DNX-SMC]    Chip Type..: AMD AM29F040
Total disk space.....: 483328       Remaining disk space.: 46604
Total FAUs...........: 3776         Available FAUs.......: 364
Total dir entries....: 1024         Free dir entries.....: 97
Used dir entries.....: 31           Deleted dir entries..: 1
File System Checksum.: 295379       File System Errors...:

               - Press any key to exit
```

7-13. File System Debug Counters.

DOWNLOAD DEVICES SOFTWARE

Description

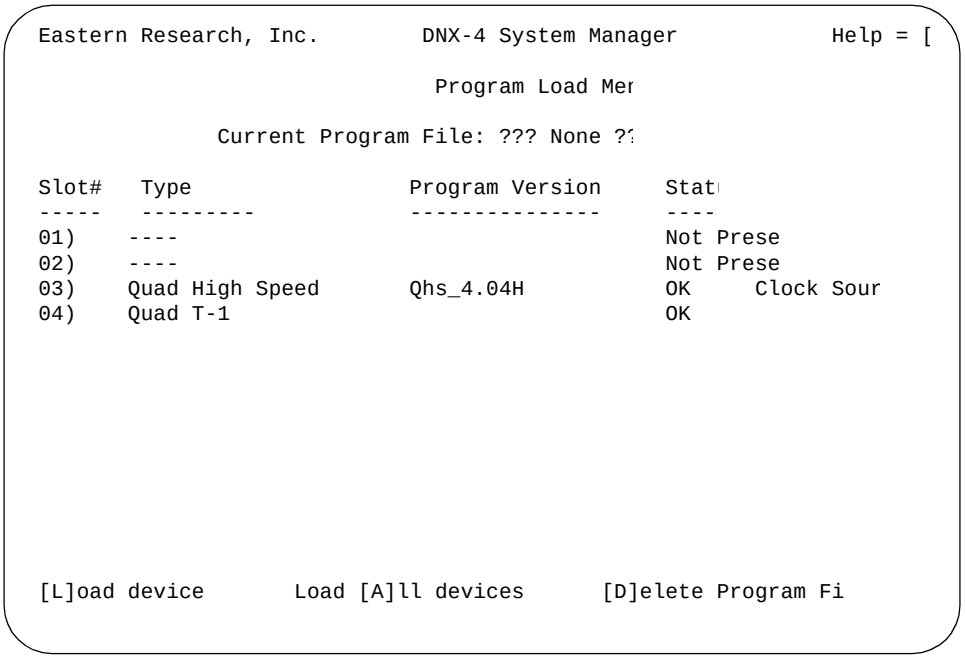
Download Devices Software allows you to download one or all of the application modules to any slot. The SMC must have the actual program that you want to download to the application module. You also have the option to delete a program file, as well.

Downloading software varies from one operating system to another. Refer to *Appendix A*, located in the back of this manual, when downloading software via TFTP applications.

Procedure

To download programs from the SMC to any application module, follow these steps:

1. From the DNX Main Menu, select Utilities. Place your cursor on the Utilities field and press **<Enter>**.
2. Then place your cursor on the Download Devices Software field and press **<Enter>**.
3. All LEDs will flash once the application module has received the program from the SMC via the Download Devices Software from the Utilities menu. There will be a brief delay while the new code is burned into FLASH memory. The application module will then re-boot itself.


Eastern Research, Inc. DNX-4 System Manager Help = [
Program Load Mer
Current Program File: ??? None ?
Slot# Type Program Version Stat
01) ---- Not Prese
02) ---- Not Prese
03) Quad High Speed Qhs_4.04H OK Clock Sour
04) Quad T-1 OK
[L]oad device Load [A]ll devices [D]elete Program Fi

7-14. Download Devices Software.

DOWNLOAD DEVICES SOFTWARE FIELD DESCRIPTIONS

[L]oad Device: To send the program from the SMC to an application module, place your cursor on a Slot # and press **[L]**. The program file must match the application module. If there is a mismatch, the program will come back with and ***ERROR*** on the screen.

Load [A]ll Devices: The program will only load to those application modules specified by the program file. Press **[A]** to load the program from the SMC to all of the application modules.

[D]elete Program File: Press **[D]** to delete the last program file that was resident in the SMC.

RESET ALL CHANNEL CARDS

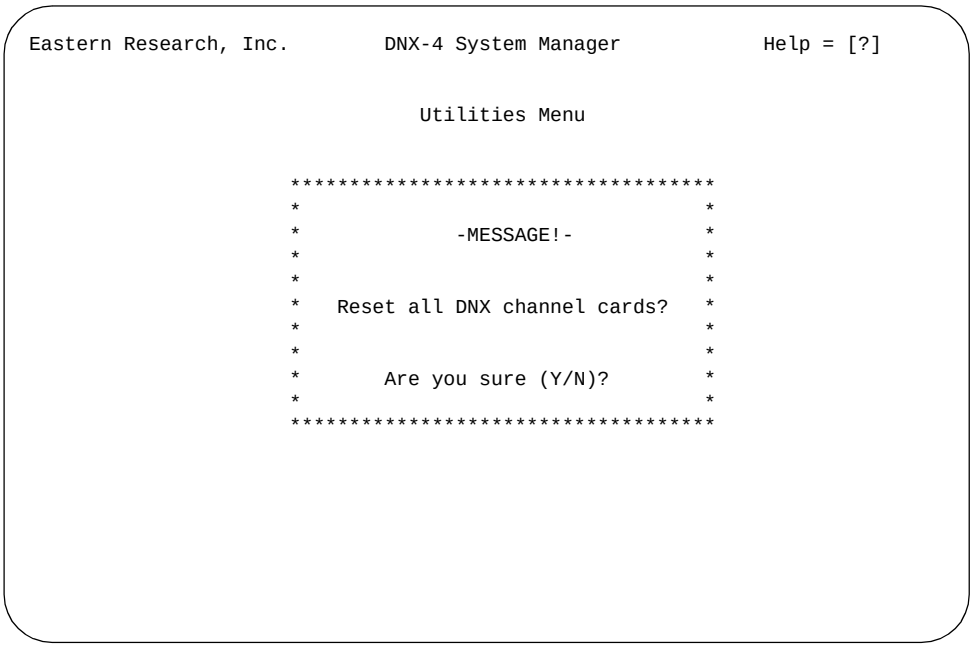
Description This option resets all of the application modules resident in the DNX system.

CAUTION: This command may be service affecting and should only be performed by knowledgeable personnel.

Before You Begin Before resetting all channel cards, return the system to its default settings.

Procedure To reset all of the application modules in the DNX:

1. From the DNX Main Menu, select Utilities. Place your cursor on the Utilities field and press **<Enter>**.
2. Then place your cursor on the Reset All Channel Cards field and press **<Enter>**. This message displays: *Reset all DNX channel cards?*
3. Type **Y**. The system resets all channel cards.



7-15. Reset All Channel Cards.

8 Cables and Interfaces

You will need cables and connectors to attach devices to the ports on the DNX system. The type of connectors and cables that are required is determined by the type of interface to which you are connecting the device.

System Manager Interface

The System Manager Interface provides an AUI port, a terminal port, a phone port for modem connection, and a 10BASE-T port.

Ethernet AUI Port

The AUI port provides a DB-15 pin receptacle for connection using thick Ethernet cabling.

Table 1: Ethernet Port AUI (DB-15)

1	chassis
2	CI+
3	DO+
4	chassis
5	DI+
6	signal ground
7	not used
8	not used
9	CI-
10	DO-
11	chassis
12	DI-
13	+12V@.25 A (max)
14	chassis
15	not used

Ethernet 10BASE-T port

The Ethernet 10BASE-T port provides an RJ48 connector for connection using twisted pair cabling.

Table 2: Ethernet 10BASE-T

10BASE-T (RJ48)	
1 transmit pair	TX+
2 transmit pair	TX-
3 receive pair	RX+
4	not used
5	not used
6 receive pair	RX-
7	not used
8	not used

Terminal Port

The terminal port allows you to connect to an external terminal, providing RJ11 modular connectors.

Table 3: Terminal (TERM) Port

Term Port (RJ11)	DCE
1	signal ground
2	CTS (output)
3	RTS (input)
4	RXD (output)
5	TXD (input)
6	chassis ground

Phone Line

The phone line provides an RJ11 6-position, 4 pin modular jack. The pin assignments are listed below:

Table 4: RJ11

1	vacant
2	NC
3	RING
4	Tip
5	NC
6	vacant

Application Module Interfaces

Quad High Speed Interfaces

The standard serial port interface (DNX10034) provides (4) DB-25 pin receptacles and supports RS232, RS530 or V.35 interfaces.

The Quad Port T1 interface (DNX15004) provides (4) RJ48C modular connectors.

Table 5: DNX10034 Interface

Pin	RS232	RS530	V.35
1	chassis	chassis	chassis
2	TXD in	TXD-	TXD-
3	RXD out	RXD-	RXD-
4	RTS in	RTS-	RTS
5	CTS out	CTS-	CTS
6	DSR out	DSR-	DSR
7	signal gnd	signal gnd	signal gnd
8	DCD out	DCD-	DCD
9	(voltage+)	RXC+	RXC+
10	(voltage-)	DCD+	not used
11	not used	EXT TXC+	EXT TXC+
12	not used	TXC+	TXC+
13	not used	CTS+	not used
14	not used	TXD+	TXD+
15	TXC out	TXC-	TXC-
16	not used	RXD+	RXD+
17	RXC out	RXC-	RXC-
18	not used	not used	not used
19	not used	RTS+	not used
20	DTR in	DTR-	DTR
21	not used	not used	not used
22	(RI) not used	DSR+	not used
23	not used	DTR+	not used
24	EXT TXC in	EXT TXC-	EXT TXC-
25	not used	not used	not used

Quad Port DS-1 Interface

The Quad Port DS-1 interface provides (4) RJ48C modular connectors. The pin assignments are listed below:

Table 6: DNX15004 Interface Pin Assignments

Pin	Signal	To/From DNX
1	Receive (R1)	To
2	Receive (T1)	To
3	Not Used	--
4	Transmit (R)	From
5	Transmit (T)	From
6	Not Used	--
7	Optional Shield Ground	--
8	Optional Shield Ground	--

Octal T1/E1 Interface

The cable should use a 50-pin connector (Amp 552726-1 or equivalent) to mate with rear board. The cable should also be shielded and provide drain wire for connection of shield to rear bezel frame ground.

Table 7: Octal T1/E1

Pin	Link #	Signal	To/From DNX
1	1	Transmit Tip	From
26	1	Transmit Ring	From
2	1	Receive Tip	To
27	1	Receive Ring	To
4	2	Transmit Tip	From
29	2	Transmit Ring	From
5	2	Receive Tip	To
30	2	Receive Ring	To
7	3	Transmit Tip	From
32	3	Transmit Ring	From
8	3	Receive Tip	To
33	3	Receive Ring	To
10	4	Transmit Tip	From
35	4	Transmit Ring	From
11	4	Receive Tip	To
36	4	Receive Ring	To
13	5	Transmit Tip	From
38	5	Transmit Ring	From
14	5	Receive Tip	To
39	5	Receive Ring	To
16	6	Transmit Tip	From
41	6	Transmit Ring	From

Table 7: Octal T1/E1

Pin	Link #	Signal	To/From DNX
17	6	Receive Tip	To
42	6	Receive Ring	To
19	7	Transmit Tip	From
44	7	Transmit Ring	From
20	7	Receive Tip	To
45	7	Receive Ring	To
22	8	Transmit Tip	From
47	8	Transmit Ring	From
23	8	Receive Tip	To
48	8	Receive Ring	To

Table 7 appears on pages 6 and 7.

Octal Voice Rear Interface Cards - E&M, FXO, and FXS

The cable should use a 50-pin connector (Amp 552726-1 or equivalent) to mate with rear board. The cable should also be shielded and provide drain wire for connection of shield to rear bezel frame ground.

NOTE: Channels 1 through 6 are located on the P1 connector; channels 7 and 8 are located on the P2 connector.

Table 8: Octal Voice - E&M

Pin	Channel #	Signal	To/From DNX
26	1	Transmit Tip	From
1	1	Transmit Ring	From
27	1	Receive Tip 1	To
2	1	Receive Ring 1	To
28	1	E	From
3	1	M	From
29	1	SB	From
4	1	SG	From
30	2	Transmit Tip	From
5	2	Transmit Ring	From
31	2	Receive Tip 1	To
6	2	Receive Ring 1	To
32	2	E	From
7	2	M	From
33	2	SB	From
8	2	SG	From
34	3	Transmit Tip	From
9	3	Transmit Ring	From
35	3	Receive Tip 1	To
10	3	Receive Ring 1	To
36	3	E	From
11	3	M	From
37	3	SB	From

Table 8: Octal Voice - E&M

Pin	Channel #	Signal	To/From DNX
12	3	SG	From
38	4	Transmit Tip	From
13	4	Transmit Ring	From
39	4	Receive Tip 1	To
14	4	Receive Ring 1	To
40	4	E	From
15	4	M	From
41	4	SB	From
16	4	SG	From
42	5	Transmit Tip	From
17	5	Transmit Ring	From
43	5	Receive Tip 1	To
18	5	Receive Ring 1	To
44	5	E	From
19	5	M	From
45	5	SB	From
20	5	SG	From
46	6	Transmit Tip	From
21	6	Transmit Ring	From
47	6	Receive Tip 1	To
22	6	Receive Ring 1	To
48	6	E	From
23	6	M	From
49	6	SB	From
24	6	SG	From
26	7	Transmit Tip	From
1	7	Transmit Ring	From

Table 8: Octal Voice - E&M

Pin	Channel #	Signal	To/From DNX
27	7	Receive Tip 1	To
2	7	Receive Ring 1	To
28	7	E	From
3	7	M	From
29	7	SB	From
4	7	SG	From
30	8	Transmit Tip	From
5	8	Transmit Ring	From
31	8	Receive Tip 1	To
6	8	Receive Ring 1	To
32	8	E	From
7	8	M	From
33	8	SB	From
8	8	SG	From

Table 8 appears on pages 8, 9, and 10.

Table 9: Octal Voice - FXO and FXS

Pin	Channel #	Signal	To/From DNX
26	1	Tip	To/From
1	1	Ring	To/From
29	2	Tip	To/From
4	2	Ring	To/From
32	3	Tip	To/From
7	3	Ring	To/From
35	4	Tip	To/From
10	4	Ring	To/From
38	5	Tip	To/From
13	5	Ring	To/From
41	6	Tip	To/From
16	6	Ring	To/From
44	7	Tip	To/From
19	7	Ring	To/From
47	8	Tip	To/From
22	8	Ring	To/From

DB-25 TO V.35 CABLE ADAPTERS (OPTIONAL)

For V.35 interface applications, you may need to use a DB-25 to V.35 cable adapter. You may purchase optional cable adapters from Eastern Research:

Part Number	Description
CBE020-00235	Male DB-25 to Male V.35
CBE020-00235	Male DB-25 to Female V.35

The pin assignments for Eastern Research's DB-25 to V.35 cable adapters are listed below:

Table 10: DB-25 to V.35 Cable Adapters

Signal	Male DB-25	Winchester V.35
Shield	1	A
TXD in A	2	P
RXD out A	3	R
RTS in	4	C
CTS out	5	D
DSR out	6	E
Signal Ground	7	B
DCD out	8	F
RXC out B	9	X
EXT CLK in	10	-
TXC out B	11	W
-	12	a*
-	13	-
TXD in B	14	S
TXC out A	15	Y
RXD out B	16	T
RXC out A	17	V
-	18	-
-	19	-
DTR in	20	H
-	21	-
-	22	-
-	23	-
EXT CLK in A	24	U
-	25	-

On AMP connectors, this pin is designated as "AA".

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9 Maintenance and Repair

Routine Maintenance

Periodic maintenance consists of cleaning the unit as necessary with a moist, lint-free cloth. Do not use solvents.

Equipment Repair and Return

Eastern Research offers Repair and Replacement services to minimize your downtime due to equipment malfunction. If advice or assistance is required, contact our Service Center at 609-273-6622 or 1-800-337-4374 during normal business hours. Repair/Replacement will be performed in accordance with the Limited Warranty statement on the inside rear cover of this manual.

If the unit has been found defective or in need of repair, Eastern Research will issue an RMA (Return Material Authorization) number. You can also complete the Repair/Replacement Card included with your unit and ship the defective equipment with the card enclosed in the package and the RMA number prominently displayed on the outside of the package. For best equipment protection, use the original cartons and packaging material. Send the unit to:

Eastern Research, Inc.
225 Executive Drive
Moorestown, NJ 08057

ATTN: RMA # _____

When calling for repair or replacement, the following information is required:

- Equipment model number
- Equipment serial number
- Brief description of problem symptoms and application
- Return shipping address (including sender's name)
- Invoice address
- Person to contact for further information (please include telephone number with area code).

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Application Modules

OVERVIEW

The DNX application modules can access the TDM buss, the ATM buss, or both as needed, depending upon the module. This modular approach translates into cost-effective solutions to a variety of communications applications. The DNX can be an inexpensive channel bank, an FT3 access multiplexer, a multi-trunk T1 access node or an enterprise network ATM backbone switch. All applications modules have LED indicators that show successful tests or indicate a loopback condition or an error. Some also have LEDs that indicate alarm conditions. Refer to the individual modules in the following chapters for more information.

SECTION 10 **Quad T-1 Module** contains 4 T-1 links, a microprocessor, and FLASH memory for program storage.

SECTION 11 **Quad High Speed Data Module** contains 4 quad high speed links, a microprocessor, and FLASH memory for program storage. The Quad Port Sync Data Module supports four high-speed synchronous data ports and accommodates synchronous data rates from 48 Kbps to 2.048 Mbps.

SECTION 12 **T-3 Module** contains 28 T-1 links, a microprocessor, and FLASH memory for program storage.

SECTION 13 **OCU-DP Module** contains 4 data ports, a microprocessor, and FLASH memory for program storage. The OCU-DP Module supports data rates of 56/64K bps.

SECTION 14 **Quad T-1 with xDSL Module** contains 4 T-1 links, a microprocessor, and FLASH memory for program storage; the xDSL mini module fits into the rear of the T-1 module to extend the length of the T-1 line.

SECTION 15 **Test Access Module (TAM)** provides four independent testers to send DDS Latching Loopback codes and execute test patterns at 56 and 64 Kbps.

SECTION 16 **Octal T1/E1 Card** supports up to eight T1 or E1 circuits on a single module. Any port can be configured for either E1 or T1 on the same module. Standard T1 or E1 modes of operation are supported along with extensive diagnostic and testing capabilities.

SECTION 17 **Octal Voice Card** has eight Analog Voice Grade Channels per module. Three rear interface modules, including E&M, FXO, and FXS, are available for use with the Octal Voice Module. Extensive diagnostics includes a variable Frequency Tone.

NOTE: **If an application module is not present in the equipment chassis, you can not access the individual screens associated with it. The menus for each application module are derived from the actual application module. Likewise, the SNMP agents for each application module reside on the card itself, if this option is selected under Configuration.**

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10 Quad DS-1

Before You Begin

In order to view the menus associated with the DS-1 module, the following must be performed:

- the Quad DS-1 card must be in a slot in the equipment nest.
- the slot must be configured for module type: Quad DS-1.
- the *Configured Type* and *Actual Type* noted on the Node Summary Menu must be Quad DS-1.

```
Eastern Research, Inc.  DNX 4 - System Manager           Help = [?]
Standby SMC not present

                                Node Summary Men

Slot#  Configured Type   Actual Type       Statu
-----  ---------------   -----------       -----
01)    Quad T1           Quad T1           Alarm
02)    Octal T1/E1       Octal T1/E1       Alarm  Test
03)    Quad OCU          Quad OCU          Ol
04)    Octal Voice       Octal Voice       Ol









SMCA)  System Manager                      Not Presen
SMCB)  System Manager                      On Lin


[C]hange slot configuration      [D]elete slot configuratio
```

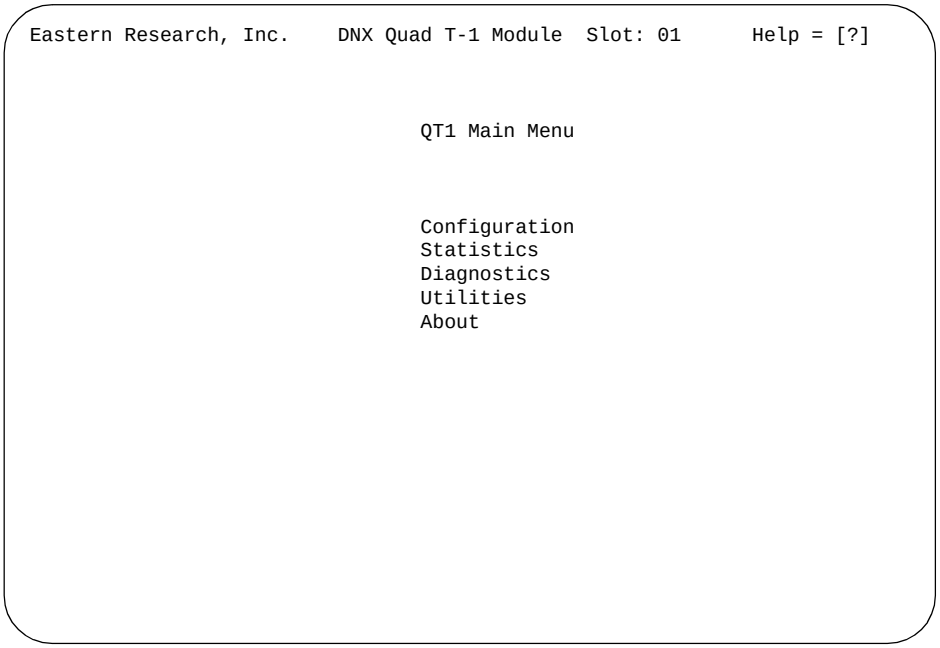
10-1. Node Summary Menu.

NOTES:

- **If the slot does not show a "configured type," refer to "Configuring a Slot" in Chapter 3 of this manual.**
- **This chapter is written from the perspective of the *ADMINISTRATOR* who employs the User Profile Manager Menu to add, change, or delete user information. Refer to Chapter 3 for an explanation of security levels.**
- **To access the User Profile Manager Menu, from the DNX Main Menu, select System Configuration, then select Users Menu. The Users Profile Manager Menu displays.**
- **To configure the Users Profile Manager for security purposes, navigate to the Users Menu.**

QUAD DS-1 MAIN MENU

The Quad DS-1 Main Menu provides options that enable you to configure the Quad DS-1 module, view diagnostics, access utilities, and display module identification.



10-2. DS-1 Main Menu.

CONFIGURING QUAD DS-1 MODULE PARAMETERS

NOTE: The Quad DS-1 configuration files are stored on the System Manager Card. When a Quad DS-1 card is replaced, the old configuration is preserved.

Procedure

To configure the Quad DS-1 module's parameters:

1. From the Main Menu, select Node Summary
2. Select a Slot that has been configured for Quad DS-1
3. From the Quad DS-1 menu, select Configuration. Place your cursor on the Configuration field and press **<Enter>**. The following screen appears.

```
Eastern Research, Inc.        DNX Quad T1 Module   Slot:01    Help =

                         Quad T1 Card Port Configurat

              Port #1        Port #2        Port #3        Port
Name........
Framing.....: ESF            ESF            ESF
Line code...: B8ZS           B8ZS           B8ZS           E
LBO.........: 0 db           0 db           0 db           0
Density.....: Clear          Clear          Clear          Cl
Ntwk loops..: Enable         Enable         Enable         Ena
Yellow alarm: Yes            Yes            Yes
ESF format..: 54016          54016          54016          54
Unused DSO's: Busy           Busy           Busy           E
Port Status : In Service     In Service     In Service     In Ser

Cascade Leds when Idle: Ye
```

10-3. Quad DS-1 Card Port Configuration Menu.

4. Configure all parameters for each port. See Configuration Field Descriptions on the following page.
5. To save changes, type **X.**
6. When prompted: "Update Configuration? Are you sure (Y/N)?" Type **Y**.

NOTE: Configuration parameters are determined by your local carrier.

CONFIGURATION FIELD DESCRIPTIONS

Name: (text field) This is a user-defined field. Any name up to 14 characters in length can be entered to identify each port on the Quad DS-1. Some users find it beneficial to use circuit numbers to name the ports.

Framing: (option field) This information must be obtained from the network supplier. Choose either D4 or ESF.

> ***D4 (SuperFrame)*** consists of 12 frames of 193 bits each for a total of 2316 bits. Each 193 bit frame consists of 192 bits preceded by one framing bit (the F bit).
>
> ***ESF (Extended SuperFrame)*** includes provisions for continuous monitoring by both the user and the telephone company central office. ESF provides a 4 Kbps link control channel (transparent to user data) which allows the telephone company to monitor the local loop, transmit and receive test messages and retrieve performance data, all without interrupting normal operations.

Line Code: (option field) This information must be obtained from the network supplier. Choose between AMI (Alternate Mark Inversion) and B8ZS (Bipolar with 8 Zero Substitution).

LBO (Line Build Out): (option field) This parameter should be set to 0 dB unless the network supplier specifically requests otherwise. The options are 0, 7.5, 15 or 22 dB.

Density: (option field) This information must be obtained from the network supplier. Choose Clear or 62411. A “Clear” network imposes no “ones density” requirements on the user. A “62411” network complies with AT&T Technical Reference #62411 and limits the DNX Quad DS-1 module transmission to no more than fifteen consecutive zeroes. If the Line Code entry is “B8ZS”, choose “Clear”. If the Line Code entry is “AMI”, choose 62411.

Network Loops: (option field) This entry determines the DS-1 module’s ability to respond to diagnostic commands received from the network supplier. Select “yes” or “enable” unless the commands are to be passed to another DS-1 device that will respond.

Yellow Alarm: (option field) “Yes” causes the DS-1 module to discard data and send a “yellow alarm” if it is in a “red alarm” condition for three seconds. “Yes” must be chosen if the network supplier is a common carrier, such as a telephone company.

ESF Format: (option field) This entry describes the types of ESF network commands that the DS-1 module will respond to. It has no meaning for D4 networks. With ESF networks, this information must be obtained from the network supplier. Choose between AT&T Technical Reference 54016 and ANSI specification T1.403.

Unused DS0s: (option field) This selection determines whether the data that will be transmitted over the unused DS0s will be “IDLE” or “BUSY.”

Port Status: (option field) This field determines the status of the port. The status will either be “in service,” (i.e., active) or “out of service,” (i.e., inactive).

VIEWING ESF STATISTICS FOR THE QUAD DS-1 MODULE

The DNX ESF Statistics screen, displays both current and 24-hour ESF statistics. The Current Statistics column displays the counts for the current time interval (maximum fifteen minutes). The 24-Hour Statistics column displays the counts for the preceeding 24-hour period.

Procedure

To display ESF Statistics for the Quad DS-1 module:

1. From the DNX Main Menu, select Node Summary.
2. Select a Slot that has been configured for Quad DS-1.
3. From the Quad DS-1 menu, select Statistics. Place your cursor on the Statistics field and press **<Enter>**.
4. From the ESF Statistics Menu, select ESF Statistics. Place your cursor on the ESF Statistics field and press **<Enter>**. The following screen appears.

```
Eastern Research, Inc.      DNX Quad T1 Module     Slot:01    Help = [?

                            Quad T-1 ESF Statistic


Register          Curr 24Hr    Curr  24Hr      Curr  24Hr      Curr 24H

Errored secs.....:0    0       0     0         0     0         0
Failed secs(UAS).:0    0       0     0         0     0         0
Severe error secs:0    0       0     0         0     0         0
Bursty error secs:0    0       0     0         0     0         0
Loss of frame cnt:0    0       0     0         0     0         0
Time in interval.:0            0               0
# Valid intervals:0            0               0
ESF status.......:F00000L0     F00000L0        F00000L0        F00000L
```

10-4. ESF Statistics screen.

ESF Statistics Field Descriptions

Errored secs: The occurrence of a Loss of Frame or a CRC6 error in a one-second period is known as an errored second. This field represents the number of errored seconds that have occurred.

Failed secs (UAS): Each second period during the occurrence of a Failed Signal State (ten consecutive errored seconds) is known as a failed second. This field represents the number of failed seconds that have occurred.

Severe error secs: A one-second period in which three hundred twenty (320) or more CRC6 errors have occurred is known as a severely errored second. This field represents the number of severely errored seconds that have occurred.

Bursty error secs: A one-second period in which more than one but less than 320 CRC6 errors has occurred is known as a bursty errored second. This field represents the number of bursty errored seconds that have occurred.

Loss of frame cnt: A loss of frame occurs when either Network equipment or the DTE senses errors in the framing pattern. Depending upon the equipment, this occurs when any 2 of 4, 2 of 5, or 3 of 5 consecutive terminal framing bits received contain bit errors in the framing pattern.

Time in interval: A timer that tracks the number of seconds in one 15-minute interval.

# of Valid intervals: A counter that tracks the total number of 15 minute intervals in a 24 hour period (up to 96).

ESF status: This field defines the status of the T1 line. The status is defined by an eight digit number that is described below:

FU0000L0

Digit #1 - “F” or “0” where “F” indicates Failed Signal State (FSS) if “U” or “L” is true.

Digit #2 - “U” or “0” where “U” indicates an unavailable signal state.

Digit #3 through #6 and #8 are always “0.”

Digit #7 - “L” or “0” where “L” indicates that the T1 line is in loop.

VIEWING ESF REGISTERS FOR THE QUAD DS-1 MODULE

The ESF Registers Menu gives the same information as the ESF Statistics Menu but it is broken down by port for each of the ninety-six 15-minute intervals in the preceding 24-hour period.

To display ESF Registers for the Quad DS-1 module:

1. From the DNX Main Menu, select Node Summary.
2. Select a Slot that has been configured for Quad DS-1.
3. From the Quad DS-1 menu, select Statistics. Place your cursor on the Statistics field and press **<Enter>**.
4. From the ESF Statistics Menu, select ESF Registers. Place your cursor on the ESF Registers field and press **<Enter>**. The following screen appears.

```
Eastern Research, Inc.    DNX Quad T-1 Module   Slot: 01      Help = [?]


                      Quad T1 ESF register summary menu
                      ---------------------------------

                          Port 1 - Port #1
                          Port 2 - Port #2
                          Port 3 - Port #3
                          Port 4 - Port #4









E[x]it menu
```

10-5. ESF Registers Summary screen.

```
Eastern Research, Inc.   DNX Quad T1 Module         Slot:01    Help = [?]

                                ESF Registers

INT ES  FS  SES BES    INT ES  FS  SES BES    INT ES  FS  SES BES
01. 000 000 000 000    17. 000 000 000 000    33. 000 000 000 000
02. 000 000 000 000    18. 000 000 000 000    34. 000 000 000 000
03. 000 000 000 000    19. 000 000 000 000    35. 000 000 000 000
04. 000 000 000 000    20. 001 000 001 000    36. 000 000 000 000
05. 000 000 000 000    21. 000 000 000 000    37. 000 000 000 000
06. 000 000 000 000    22. 000 000 000 000    38. 000 000 000 000
07. 000 000 000 000    23. 000 000 000 000    39. 000 000 000 000
08. 000 000 000 000    24. 000 000 000 000    40. 000 000 000 000
09. 000 000 000 000    25. 000 000 000 000    41. 000 000 000 000
10. 000 000 000 000    26. 000 000 000 000    42. 000 000 000 000
11. 000 000 000 000    27. 000 000 000 000    43. 000 000 000 000
12. 000 000 000 000    28. 000 000 000 000    44. 000 000 000 000
13. 000 000 000 000    29. 000 000 000 000    45. 000 000 000 000
14. 000 000 000 000    30. 000 000 000 000    46. 000 000 000 000
15. 000 000 000 000    31. 000 000 000 000    47. 000 000 000 000
16. 000 000 000 000    32. 000 000 000 000    48. 000 000 000 000

Next/previous page = [Return/Space]
```

10-6. ESF Registers.

Procedure (cont.)

5. From the ESF Registers Summary menu, select a port to access the ESF Registers. Place your cursor on a port and press **<Enter>**.

ESF REGISTER FIELD DESCRIPTIONS

Errored Seconds (ES): The occurrence of a Loss of Frame or a CRC6 error in a one-second period is known as an errored second. This field represents the number of errored seconds that have occurred.

Failed Seconds (FS): Each second period during the occurrence of a Failed Signal State (ten consecutive errored seconds) is known as a failed second. This field represents the number of severely errored seconds that have occurred.

Severely Errored Seconds (SES): A one-second period in which three hundred twenty (320) or more CRC6 errors have occurred is known as a severely errored second. This field represents the number of severely errored seconds that have occurred.

Bursty Errored Seconds (BES): A one-second period in which more than one but less than 320 CRC6 errors has occurred is known as a bursty errored second. This field represents the number of bursty errored seconds that have occurred.

QUAD DS-1 MODULE DIAGNOSTICS

Procedure

To view diagnostics on the Quad DS-1 module:

1. From the DNX Main Menu, select Node Summary.
2. Select a Slot that has been configured for Quad DS-1.
3. From the Quad DS-1 menu, select Diagnostics. Place your cursor on Diagnostics and press **<Enter>**. The following screen appears.

```
Eastern Research, Inc.      DNX Quad T1 Module    Slot:01    Help = [?]

                               Diagnostic Menu
Name...........:
Port Status....: In Service   In Service      In Service      In Service

Loop selection.: Off          Off             Off             Off

NI BERT........: Off          Off             Off             Off
Error seconds..: 0            0               0               0
Seconds in test: 0            0               0               0

                State ErrSec  State ErrSec  State ErrSec    State ErrSec
AIS............: No   0       No   0          No   0          No   0
RED............: No   0       No   0          No   0          No   0
YEL............: No   0       No   1          No   1          No   1
Ferr...........: No   1       No   1          No   1          No   1
CRC6...........: No   1       No   1          No   1          No   1
BPV............: No   1       No   1          No   1          No   1
LOS............: No   0       No   0          No   0          No   0


[R]eset counts     Insert Bert [E]rrors
```

10-7. Quad DS-1 Diagnostics Menu.

DIAGNOSTICS FIELD DESCRIPTIONS

Name: This is a user-defined field. Any name up to 14 characters in length can be entered to identify each port on the Quad DS-1. Some users find it beneficial to use circuit numbers to name the ports.

Port Status: This field determines the status of the port. The status will either be “in service” or “out of service”.

Loop selection: If you turn the local loop “ON,” the front panel “LP” LED will illuminate and local testing can be performed by external DTE equipment or by the DNX’s internal BERT.

Loop selections	Description
Local Loop	Loops DS-1 back to card
Line Loop	Loops DS-1 to network
Payload Loop	Loops DS-1 to network. Signal is disassembled and reassembled through the card’s framer
CSU Line Loop	Loops remote CSU toward DNX
CSU Loop Unframed	Loops remote CSU toward DNX, DS-1 unframed
Smart Jack 58-U	Loops remote Smart Jack towards DNX
User Defined	Allows you to set up code that is defined by the user (e.g., activate/ deactivate code length, loop activate/deactivate code)
Off	No loops

NI BERT: This is useful for testing the bit error rate of the communication circuit via the NI. The device checks for errors by comparing a received data pattern with a known transmitted data pattern to determine line quality.

Error seconds: This read-only count represents the number of errored seconds that occurred in a one second period while the Quad DS-1 module was in test.

Seconds in test: This read-only count represents the number of seconds the Quad DS-1 module was in test.

State: This field shows whether the alarm is active or inactive.

ErrSec: This read-only count represents the number of errored seconds that occurred in a one second period while the DS-1 module was in test.

AIS: An unframed “all ones” condition has been detected.

RED: A “loss of frame alignment” has occurred and synchronization has been lost.

YEL: A Yellow Alarm is generated by the network and sent to the customer premises. It usually means that the network is not receiving the DNX signalling correctly (i.e., the network is not in sync or a red alarm has occurred).

Ferr (framing errors): One or more frame alignment bit errors have been detected. This does not mean, however, that synchronization has been lost.

CRC6: One or more CRC6 block errors have been detected. The D4 framing does not include CRC6; the DS-1 Quad module replaces that parameter.

BPV: Bipolar violations have been detected. This usually indicates that a very weak or excessively strong signal is being received from the network.

LOS: This indicates a loss of signal detection. No signal is present on the RX pair to the DNX DS-1 module (DS-1 loop).

Commands

[R]eset counts: Clears all counts.

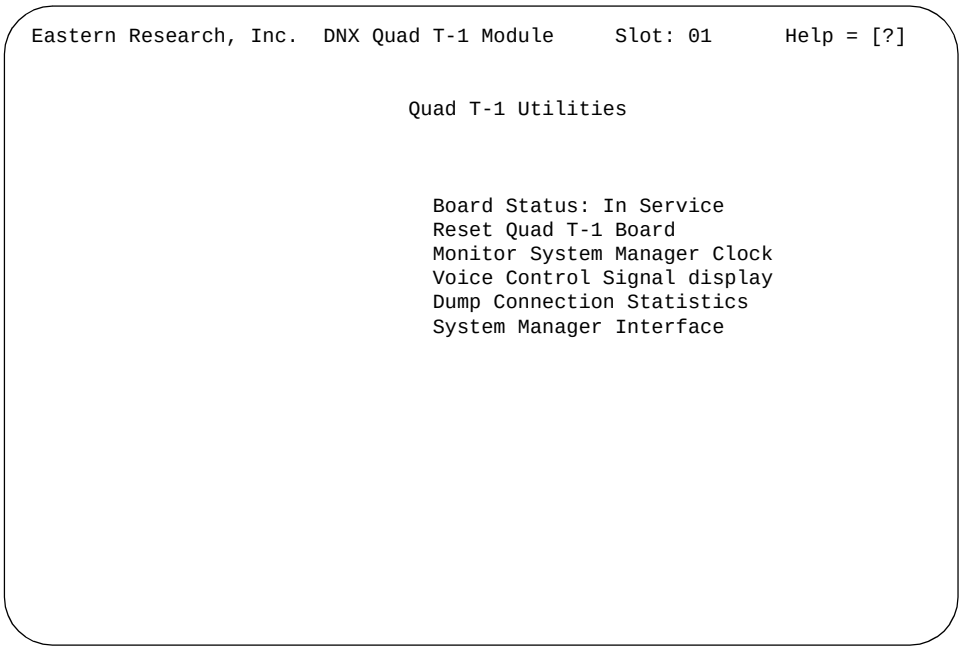
Insert Bert [E]rrors: For test purposes, insert BERT errors.

QUAD DS-1 MODULE UTILITIES

Procedure

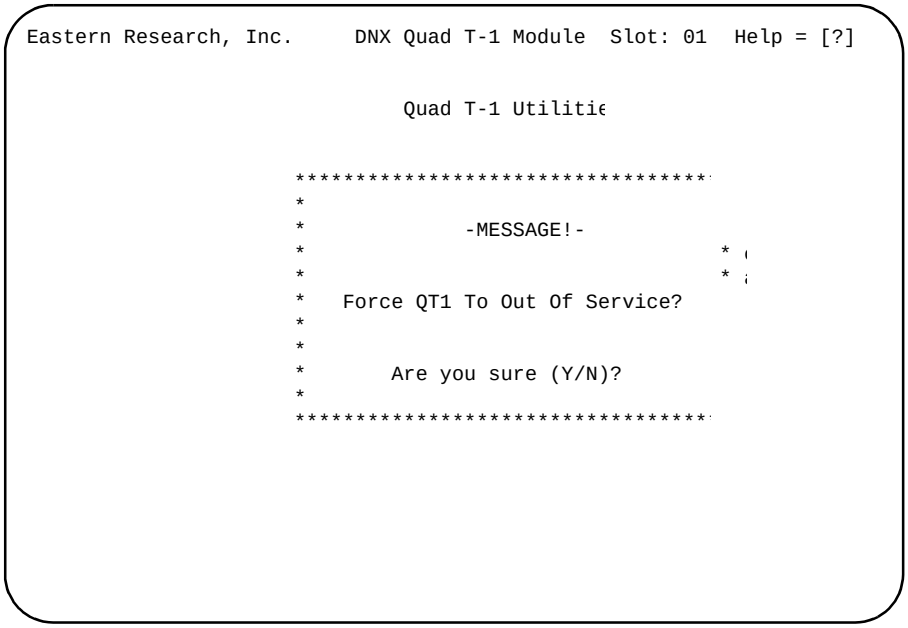
To access the Quad DS-1 Utilities:

1. From the DNX Main Menu, select Node Summary.
2. Select a Slot that has been configured for Quad DS-1.
3. From the Quad DS-1 menu, select Utilities. Place your cursor on Utilities and press **<Enter>**. The following screen appears.

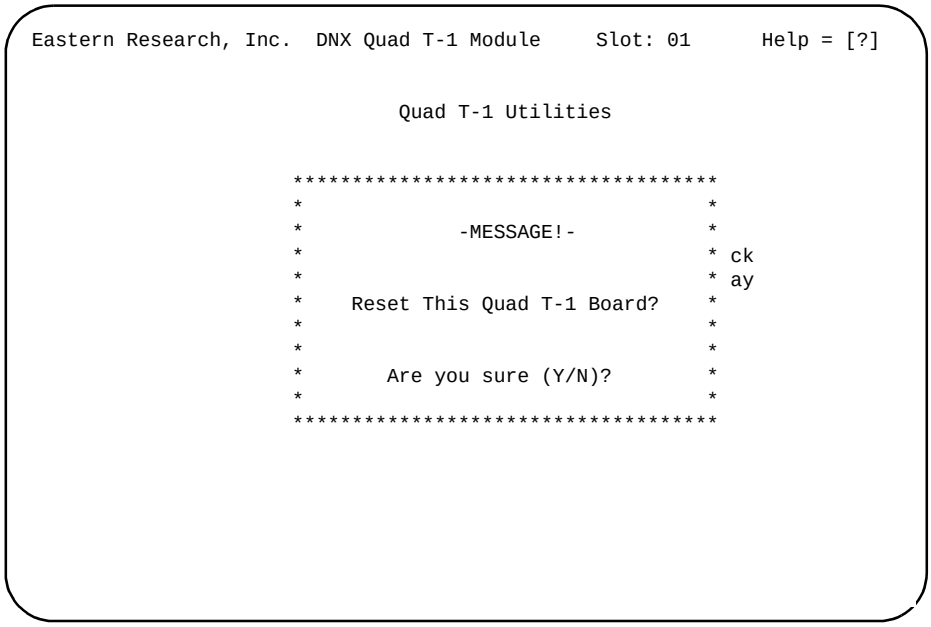

Eastern Research, Inc. DNX Quad T-1 Module Slot: 01 Help = [?]
Quad T-1 Utilities
Board Status: In Service
Reset Quad T-1 Board
Monitor System Manager Clock
Voice Control Signal display
Dump Connection Statistics
System Manager Interface

10-8. Quad DS-1 Utilities Menu.

NOTE: The fields shown in this menu are the default settings and should not be accessed or configured unless you are established as a high level user (e.g., Developer); they are for debugging purposes only. It is strongly suggested that you do not tamper with these fields unless prompted to do so by an Eastern Research Technical Support Representative.



10-9. Board Status Screen.



10-10. Reset Quad DS-1 Board.

```
Eastern Research, Inc.    DNX Quad T-1 Module    Slot: 01    Help = [?]

                        Monitor Backplane Integrity

Slot #     Slot #      Slot #     Pattern    Patt.      Status
------     Address     Received   Address    Rcv    (Ignore for QHS)
Slot #1    0x00205007     01      0x00205008  08     ... OK ...
Slot #2    0x00205009     02      0x0020500a  09     ... OK ...
Slot #3    0x0020500b     03      0x0020500c  07     ... OK ...
Slot #4    0x0020500d     0f      0x0020500e  0f
Slot #5    0x0020500f     0f      0x00205010  0f
Slot #6    0x00205011     0f      0x00205012  0f
Slot #7    0x00205013     0f      0x00205014  0f
Slot #8    0x00205015     0f      0x00205016  0f
Slot #9    0x00205017     0f      0x00205018  0f
Slot #10   0x00205019     0f      0x0020501a  0f
Slot #11   0x0020501b     0f      0x0020501c  0f
Lost System Clock Count.: 1
Lost Frame Sync Count...: 1       Invalid Signal Ram locations:0
OnBusBadClock Count: 0            Total Scanner Sweeps:31444
OffBusGoodClock Ctr: 0            Total Signal Dirty Sweeps:0


                              [R]eset Clock Cntrs [C]lear Ram Cntrs
```

10-11. Monitor Backplane Integrity.

```
Eastern Research, Inc.    DNX Quad T-1 Module   Slot: 01    Help = [

PCM signalling display menu..
Port #1     From    To                                  From
            Framer  Framer                              Framer  Fram
     Write  -------------- Read                  Write  -------------- Re
DS0  BTS    ABCD    ABCD   BTS          DS0  BTS    ABCD    ABCD   B
================================        ================================
 1    **    No Connection    **<-       13    **    No Connection
 2    **    No Connection    **         14    **    No Connection
 3    **    No Connection    **         15    **    No Connection
 4    **    No Connection    **         16    **    No Connection
 5    **    No Connection    **         17    **    No Connection
 6    **    No Connection    **         18    **    No Connection
 7    **    No Connection    **         19    **    No Connection
 8    **    No Connection    **         20    **    No Connection
 9    **    No Connection    **         21    **    No Connection
10    **    No Connection    **         22    **    No Connection
11    **    No Connection    **         23    **    No Connection
12    **    No Connection    **         24    **    No Connection
          I/O Address     Data   Trans.      I/O Address  Data  Monit
DS0: 01


                              [N]ext Port             [C]le
```

10-12. Voice Control Signal Display.

```
Eastern Research, Inc.    DNX Quad T-1 Module   Slot: 01     Help =

Display All Connection Statistics..


                              Port 1   Port 2   Port 3    Port 4  Tot
Total Signalling TS:          0        0        0         0
Total Src Voice TS.:          0        0        0         0
Total Dest Voice TS:          0        0        0         0
Total Src Data TS..:          0        0        0         0
Total Dest Data TS.:          0        0        0         0

Total Data TS......:
Total Voice TS.....:
                              ---
Total TS Used......:









Exit = ['X']
```

10-13. Dump Connection Statistics.

```
Eastern Research, Inc.    DNX Quad T-1 Module    Slot:     Help = [?]









                      System Manager Interface Stat
                      -----------------------------
                Configuration Map sequence number.......:
                Downloaded Config Map sequence number...:
                Configuration Map Checksum..............
                Configuration Map Byte Count............
                Number of Configuration Map changes.....
                Number of Configuration Maps downloads..
                System Manager Level Identifier.........: (
                System Manager Id.......................:
                System Files sequence number............
```

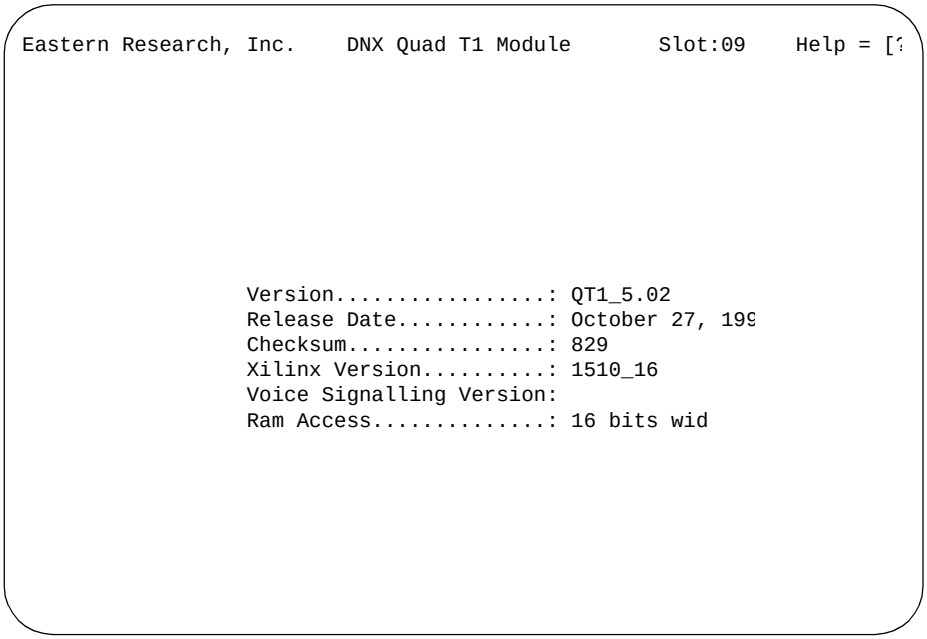
10-14. System Manager Interface.

QUAD DS-1 ABOUT MENU

Procedure

To display identification information for the Quad DS-1 module:

1. From the Main Menu, select Node Summary.
2. Select a Slot that has been configured for Quad DS-1.
3. From the DS-1 Main Menu, select About. Place your cursor on the About field and press **<Enter>**. The following screen appears.


Eastern Research, Inc. DNX Quad T1 Module Slot:09 Help = [
Version.....: QT1_5.02
Release Date.....: October 27, 199
Checksum.....: 829
Xilinx Version.....: 1510_16
Voice Signalling Version:
Ram Access.....: 16 bits wid

10-15. Quad DS-1 About Menu.

ABOUT MENU FIELDS

Version: This is the software version current in the DS-1's flash memory.

Release Date: The engineering release to production.

Checksum: The sum of all bytes in the DS-1's flash memory at power up.

XILINX Version: The hardware version of downloadable, programmable devices.

Voice Signaling Version: The revision level of software used in the commands bits for voice signaling.

Ram Access: The size of the memory buss.

11 Quad High Speed

Before You Begin

In order to view the menus associated with the Quad High Speed module, the following must be performed:

- the Quad High Speed card must be in a slot in the equipment nest.
- the slot must be configured for module type: Quad High Speed.
- the Configured Type and Actual Type noted on the Node Summary Menu must be Quad High Speed.

```
Eastern Research, Inc.       DNX 4 - System Manag     Help = [?
Standby SMC not prese

                                Node Summary

Slot#  Configured Type   Actual Type       St
-----  ---------------   -----------       --
01)    Quad T1           Quad T1           Ala
02)    T3                ----              Not Pr
03)    Quad OCU          Quad OCU
04)    Octal Voice       Octal Voice









SMCA)  System Manager                      Not Pr
SMCB)  System Manager                      On


[C]hange slot configuration      [D]elete slot configur
```

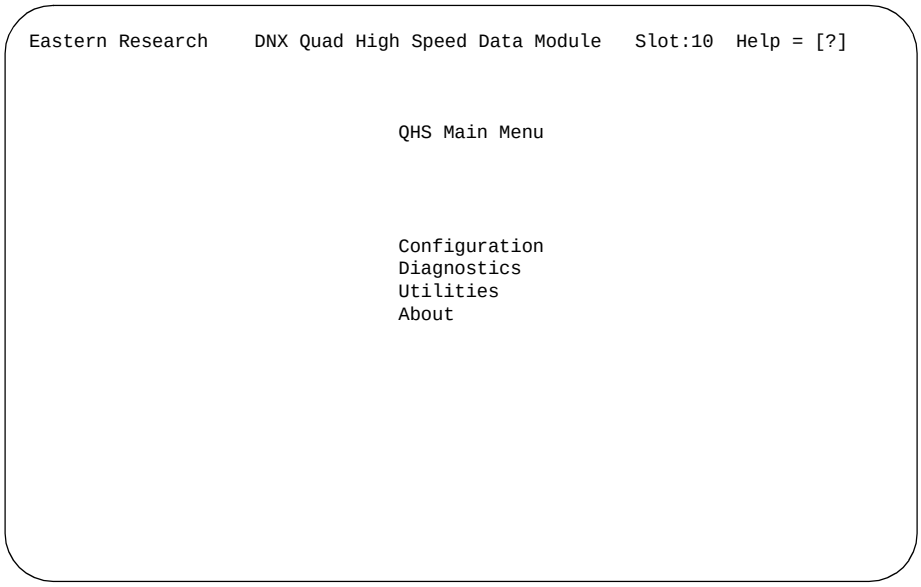
11-1. Node Summary Menu.

NOTE:

- **If the slot does not show a "configured type," refer to "Configuring a Slot" in Chapter 3 of this manual.**
- **This chapter is written from the perspective of the *ADMINISTRATOR* who employs the User Profile Manager Menu to add, change, or delete user information. Refer to Chapter 3 for an explanation of security levels.**
- **To access the User Profile Manager Menu, from the DNX Main Menu, select System Configuration, then select Users Menu. The Users Profile Manager Menu displays.**
- **To configure the Users Profile Manager for security purposes, navigate to the Users Menu.**

QUAD HIGH SPEED MODULE MAIN MENU

The Quad High Speed Main Menu provides options that enable you to configure the Quad High Speed Module, perform diagnostics, access utilities, and display version and release information.



11-2. Quad High Speed Main Menu.

CONFIGURING QUAD HIGH SPEED MODULE PARAMETERS

Procedure

To configure the Quad High Speed module's parameters:

1. From the Main Menu, select Node Summary.
2. Select a Slot that has been configured for Quad High Speed.
3. From the QHS main menu, select Configuration. Place your cursor on Configuration and press **<Enter>**. The following screen appears.

```
Eastern Research   DNX Quad High Speed Data Module  Slot:10   Help = [?]

                              Configuration Menu

               Port 1          Port 2           Port 3           Port 4

Name.........:x               port name        port name        port name
Speed........:1536000         1536000          1536000          1536000
Timing.......:Internal        Internal         Internal         Internal
DCD out......:Forced On       Forced On        Forced On        Forced On
DSR out......:Forced Off      Forced On        Forced On        Forced On
Data.........:Normal          Normal           Normal           Normal
Clock........:Normal          Normal           Normal           Normal
Interface....:V.35            V.35             V.35             V.35
V.54 loop....:Disabled        Enabled          Disabled         Disabled
Connect Event:Disabled        Disabled         Disabled         Disabled
Port Status..:In Service      In Service       In Service       In Service

Cascade Leds when Idle: Yes
```

11-3. Quad High Speed Configuration Menu.

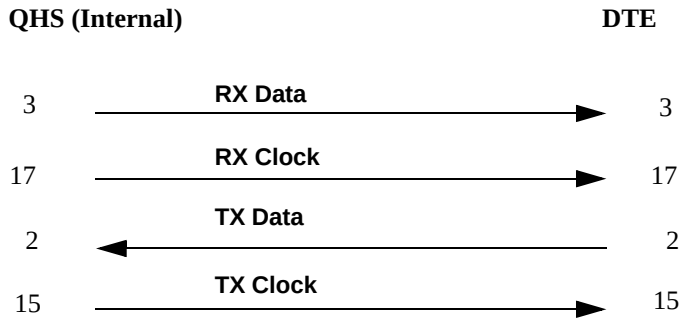
4. Configure all parameters for each port. For field descriptions, see the following page.
5. To save changes, type **X**.
6. When prompted: "Update Configuration? Are you sure (Y/N)?" Type **Y**.

QHS CONFIGURATION FIELD DESCRIPTIONS

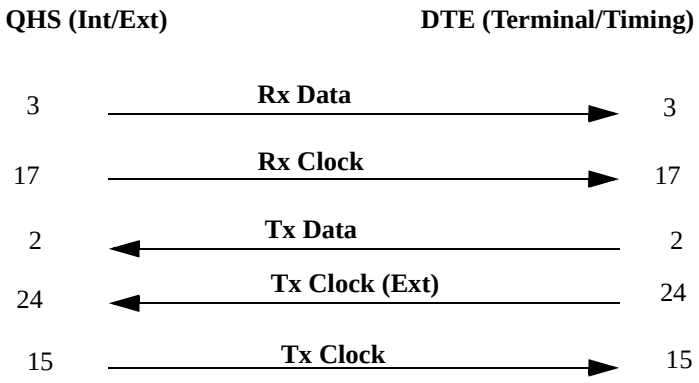
Name: This is a user-defined field. Any name up to 14 characters in length can be entered to identify each port on the Quad High Speed Module.

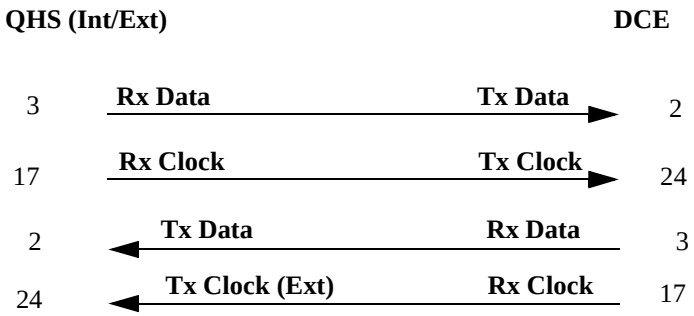
Speed: The Quad High Speed module operates at speeds from 48 Kbps to 2.048 Mbps (Nx56/64 Kbps).

Timing: The timing options are Internal, Int/Ext, or External. Internal is the normal setting and should always be chosen unless there is a specific reason to do otherwise. The Quad High Speed module will provide both TX clock and RX clock to the DTE.



Int/Ext is recommended if the attached user DTE cable exceeds 10 feet in length and the customer data rate exceeds 224 Kbps. This setting may require a special DTE configuration or a modified cable.



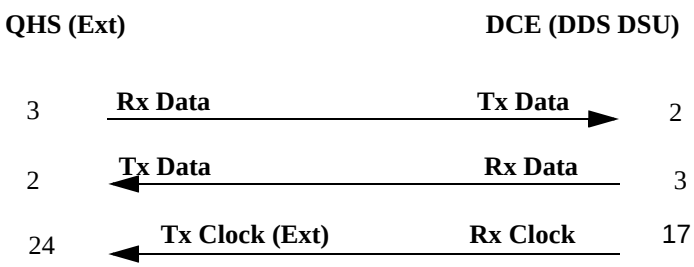


Int/Ext should be used if the attached equipment is DCE. The remote DCE must be loop timed to achieve the required timing lock with the DNX system clock.

NOTE: When a QHS port is connected to a DCE a crossover needs to be used.

External should be used if the attached equipment is DCE that does not accept a clock such as a digital data system (DDS) DSU. The DSU and the DNX system must be locked to the same timing source (usually network clock).

The DSU can provide timing to the DNX system when it is attached to port 1 and the port is configured as source clock.



NOTE: RS232 pin numbers are used for reference.

DCD Out: (option field) The quad high speed module presents a DCE interface to the attached customer equipment. Carrier detect can be forced off, forced on, track RTS, or switched. “Switched” is normally on and turns off upon network carrier failure.

DSR Out: (option field) Data Set Ready can be forced off, forced on, or track DTR.

Data: (option field) The options are normal or inverted.

Clock: (option field) Initially choose “Normal.” If frequent errors occur at the port, try “Inverted” and check performance.

Normally, the down-going clock edge is in the middle of each bit. On lengthy cables when a clock is sent from one device to clock data from the other device, the data arrives skewed from the originating clock due to the round

trip cable delay. When the delay is such that the originating clock down-going edge is on the edge of the bit returned, “Inv” will correct this condition inside the QHS module.

Interface: (option field) The interface options are V.35, RS530/422 and RS232.

V.54 Loop: (option field) When enabled, this port will respond to receipt of a remote digital loop command arriving from the port of the mated Quad High Speed module. When disabled, it will not respond to a remote digital loop command.

Connect event: Enables or disables the connection or disconnection of a port to be recorded in the System Event menu.

Port status: This field determines the status of the port. The status will either be “in service” or “out of service.” If the port is out of service it can still run data; only the diagnostics will be affected.

Cascade LED: Blinking LEDs that indicate the board is working.

QUAD HIGH SPEED DATA MODULE DIAGNOSTICS

Procedure

To view diagnostics on the Quad High Speed Data module, follow these steps:

1. From the DNX Main Menu, select Node Summary.
2. Select a Slot that has been configured for Quad High Speed.
3. From the QHS Main Menu, select Diagnostics. Place your cursor on the Diagnostics field and press **<Enter>**. The following screen appears.

```
Eastern Research  DNX Quad High Speed Data Module  Slot:10    Help = [?]

                                Diagnostic Menu
Name...........: x               port name       port name       port
name

Status.........: In Service      In Service      In Service      In
Service
Local Loop.....: Off             Off             Off             Off
Remote Loop....: Off             Off             Off             Off

BERT...........: 2047            Off             Off             Off
Seconds in test: 15837           0               0               0
Local Errors...: 159             0               0               0
Remote Errors..: 175             0               0               0

                                 Indicators:
                                 -----------
TX/RX Data.....: On /On          On /On          On /On          On /On
RTS/DCD........: Off/On          Off/On          Off/On          Off/On
DTR/DSR........: Off/Off         Off/On          Off/On          Off/On


[R]eset counts      Insert [e]rrors
```

11-4. QHS Diagnostics Menu.

QHS DIAGNOSTICS MENU FIELD DESCRIPTIONS

CONTROLS

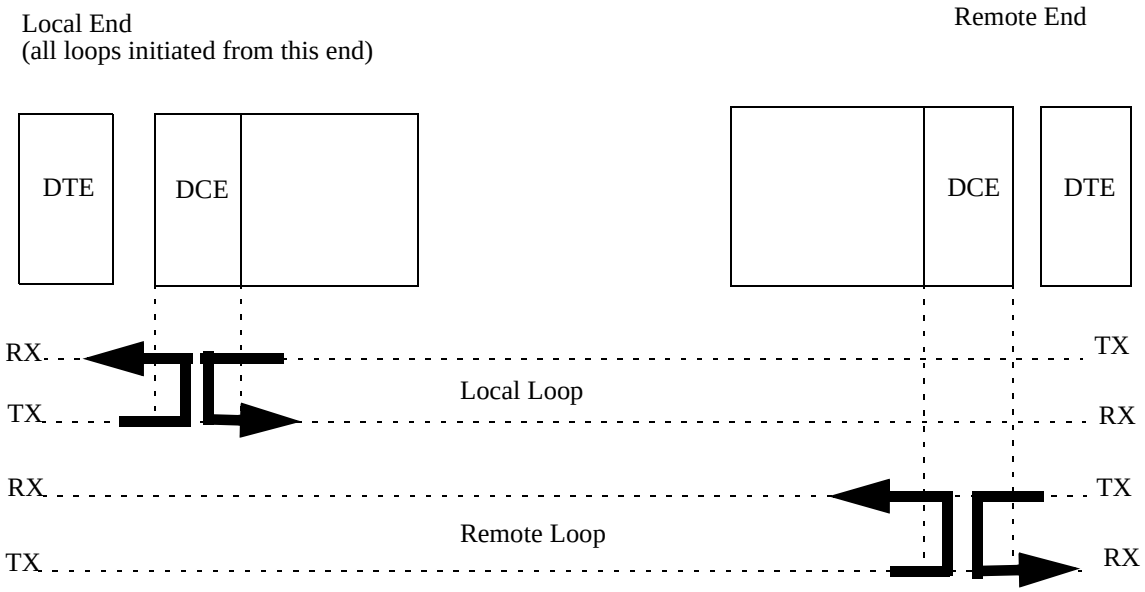
Name: This is a user-defined field. Any name up to 14 characters in length can be entered to identify each port on the Quad High Speed Module.

Status: The unit's status is either "in service or out of service."

Local Loop: When set to ON, this parameter causes a bi-directional local loop at the High Speed Data Module where the command was entered. If you turn the local loop "ON," the front panel "LOOP" LED will illuminate and local testing can be performed by external DTE equipment or by DNX's internal BERT. Only data is looped back. Clocks and control signals are not looped back.

Remote Loop (V.54): Remote Loop causes a remote line loop at the distant end of a point-to-point circuit.

The following diagram illustrates local and remote loops.



11-5. Local and Remote Loops.

BERT: This is useful for testing for errors on the communication circuit. The device checks for errors by comparing a received data pattern with a known transmitted data pattern to determine line quality.

NOTE: The remote loop and data test patterns depend on interface clocks to operate. If Int/Ext or External timing options are selected, ensure the External Clock is present and locked to the DNX system clock.

Seconds in Test: This read-only count represents the number of seconds the data module was in test.

Local Errors: This read-only count represents the number of local errored seconds that occurred in a one second period while the data module was in test.

Remote Errors: This read-only count represents the number of remote errored seconds that occurred in a one second period while the data module was in test.

INDICATORS

TX/RX Data: If this indicator is ON, your high speed data module is transmitting/receiving data over its serial port interface.

RTS/DCD: If RTS is ON, your high speed data module is sending a "Request-to-Send" signal over its serial port interface. If DCD is ON, your high speed data module is sending a "Data Carrier Detect" signal over its serial port interface.

DTR/DSR: If DTR is ON, the high speed data module is sending a "Data Terminal Ready" signal over its serial port interface. If DSR is ON, the high speed data module is sending a "Data Set Ready" signal over its serial port interface.

COMMANDS

[R]eset counts: This command allows you to clear the counters.

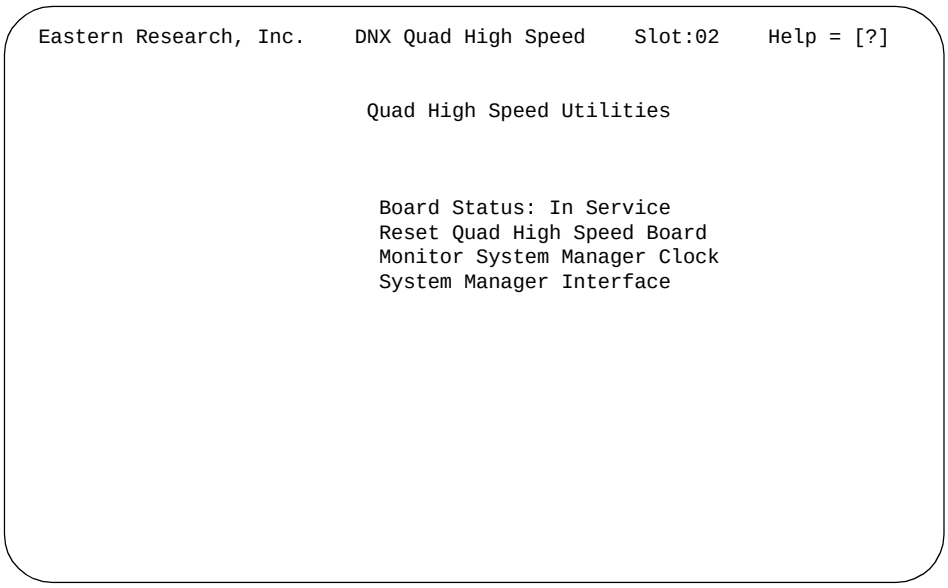
Insert [e]rrors: For test purposes, insert BERT errors.

QUAD HIGH SPEED UTILITIES

Procedure

To access the Quad High Speed Utilities, follow these steps:

1. From the DNX Main Menu, select Node Summary.
2. Select a Slot that has been configured for Quad High Speed.
3. From the QHS Main Menu, select Utilities. Place your cursor on the Utilities field and press **<Enter>**. The following screen appears.


Eastern Research, Inc. DNX Quad High Speed Slot:02 Help = [?]
Quad High Speed Utilities
Board Status: In Service
Reset Quad High Speed Board
Monitor System Manager Clock
System Manager Interface

11-6. Utilities Menu.

NOTE: The fields shown in this menu are the default settings and should not be accessed or configured unless you are established as a high level user (e.g., Developer); they are for debugging purposes only. It is strongly suggested that you do not tamper with these fields unless prompted to do so by an Eastern Research Technical Support Representative.

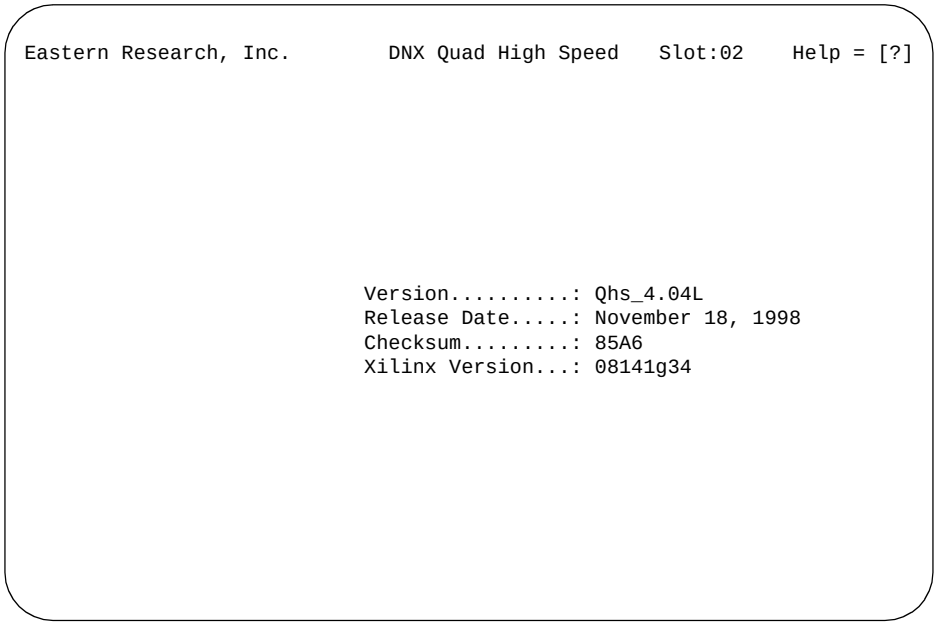
- **Board Status** shows whether the board is in service or out of service.
- **Reset Quad High Speed Board** resets or re-initializes the QHS card.
- **Monitor System Manager Clock** gives the status of vital system timing.
- **System Manager Interface** provides system manager statistics, such as map checksum and byte count.

QUAD HIGH SPEED ABOUT MENU

Procedure

To display identification information for the Quad High Speed module:

1. From the Main Menu, select Node Summary.
2. Select a Slot that has been configured for Quad High Speed.
3. From the QHS Main Menu, select About. Place your cursor on the About field and press **<Enter>**. The following screen appears.


Eastern Research, Inc. DNX Quad High Speed Slot:02 Help = [?]
Version.....: Qhs_4.04L
Release Date.....: November 18, 1998
Checksum.....: 85A6
Xilinx Version...: 08141g34

11-7. About Menu.

About Menu Field Descriptions

Version: This is the software version current in the QHS's flash memory.

Release Date: The engineering release to production.

Checksum: The sum of all bytes in the QHS's flash memory at power up.

XILINX Version: The hardware version of downloadable, programmable devices.

12 T-3 Module

Before You Begin

In order to view the menus associated with the T-3 module, the following must be performed:

- the T-3 card must be in a slot in the equipment nest.
- the slot must be configured for module type: T-3.
- the *Configured Type* and *Actual Type* noted on the Node Summary Menu must be T-3.

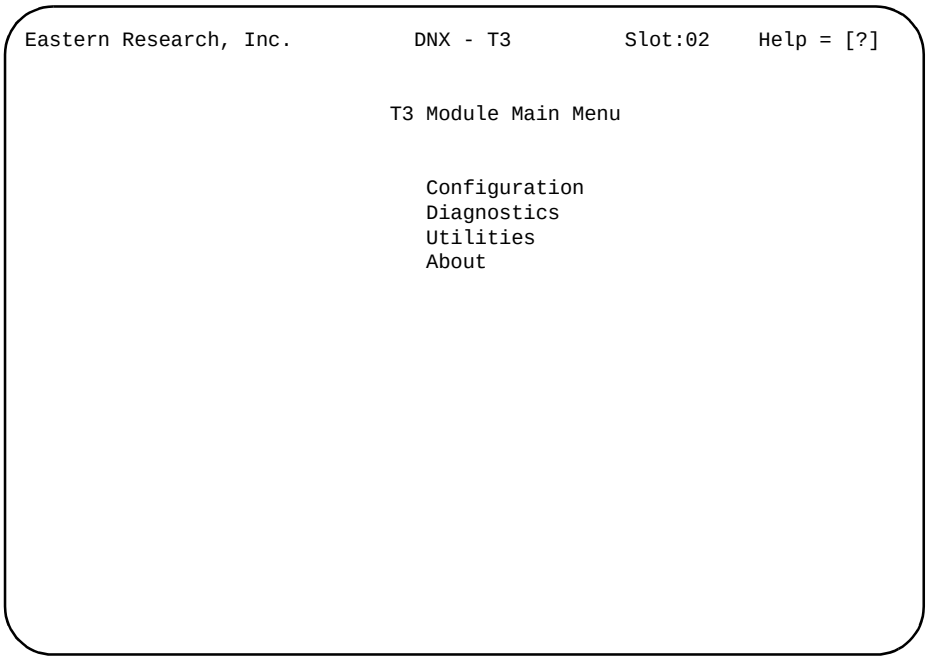
```
Eastern Research, Inc.       DNX 4 - System Manager      Help = [?]
Standby SMC not present

                                Node Summary Menu

Slot#  Configured Type   Actual Type       Status
-----  ---------------   -----------       ------
01)    Quad T1           Quad T1           Alarm
02)    T3                T3                Alarm
03)    Quad OCU          Quad OCU          OK
04)    Octal Voice       Octal Voice




SMCA)  System Manager                      Not Present
SMCB)  System Manager                      On Line

[C]hange slot configuration      [D]elete slot configuration
```

12-1. Node Summary Menu.

NOTE:

- **If the slot does not show a "configured type," refer to "Configuring a Slot" in Chapter 3 of this manual.**
- **This chapter is written from the perspective of the *ADMINISTRATOR* who employs the User Profile Manager Menu to add, change, or delete user information. Refer to Chapter 3 for an explanation of security levels.**
- **To access the User Profile Manager Menu, from the DNX Main Menu, select System Configuration, then select Users Menu. The Users Profile Manager Menu displays.**
- **To configure the Users Profile Manager for security purposes, navigate to the Users Menu.**

T-3 MAIN MENU



12-2. T-3 Main Menu.

The T-3 provides options that enable you to configure the T-3 module, view diagnostics, access utilities, and display version and release information.

CONFIGURING THE T-3 MODULE PARAMETERS

Procedure

To configure the T-3 module's parameter's:

1. From the Main Menu, select Node Summary.
2. Select a Slot that has been configured for T-3.
3. From the T-3 Main Menu, select Configuration. Place your cursor on the Configuration field and press **<Enter>**. The following screen appears.

```
Eastern Research, Inc.         DNX DS3 Module - Slot:  1


                           Configuration Menu
                           ------------------

                           T1 Configuration
                           T3 Configuration
                           Options









Navigate menu    = [Space/Backspace]
Change parameter = [Return/'B']
Exit/abort edits = ['X'/Esc]
```

12-3. T-3 Configuration Menu.

The T-3 Configuration Menu has three configuration options:

- Select ***T-1 Configuration*** to configure the T-1 link of the T-3 line.
- Select ***T-3 Configuration*** to configure the T-3 line.
- Select ***Options*** for the T-1 links and the T-3 line.

T-1 CONFIGURATION

Procedure

To configure the T-1 link of the T-3 line:

4. From the Main Menu, select Node Summary.
5. Select a Slot that has been configured for T-3.
6. From the T-3 Main Menu, select Configuration. Place your cursor on the Configuration field and press **<Enter>**.
7. Select T-1 Configuration from the Configuration Menu. Place your cursor on the T-1 Configuration field and press **<Enter>**. The following screen appears.

```
Eastern Research, Inc.         DNX DS3 Module - Slot:  1

                          T1 Configuration Manager

Chl  Name            Status        Frm Density NetLp Yalarm Format ICode
-------------------------------------------------------------------------
01 Circuit Number    In Service    ESF  Clear   Yes   Yes   54016   Busy
02 Circuit Number    In Service    ESF  Clear   Yes   Yes   54016   Busy
03 Circuit Number    In Service    ESF  Clear   Yes   Yes   54016   Busy
04 Circuit Number    In Service    ESF  Clear   Yes   Yes   54016   Busy
05 Circuit Number    In Service    ESF  Clear   Yes   Yes   54016   Busy
06 Circuit Number    In Service    ESF  Clear   Yes   Yes   54016   Busy
07 Circuit Number    In Service    ESF  Clear   Yes   Yes   54016   Busy
08 Circuit Number    In Service    ESF  Clear   Yes   Yes   54016   Busy
09 Circuit Number    In Service    ESF  Clear   Yes   Yes   54016   Busy
10 Circuit Number    In Service    ESF  Clear   Yes   Yes   54016   Busy
11 Circuit Number    In Service    ESF  Clear   Yes   Yes   54016   Busy
12 Circuit Number    In Service    ESF  Clear   Yes   Yes   54016   Busy
13 Circuit Number    In Service    ESF  Clear   Yes   Yes   54016   Busy
14 Circuit Number    In Service    ESF  Clear   Yes   Yes   54016   Busy

Navigate menu    = [Space/Backspace] Change parameter = [Return/'B']
[N]ext Page   [C]opy Cfg To All   Exit/abort edits = ['X'/Esc]
```

12-4. T-1 Configuration Manager Menu.

8. To change a parameter for an individual channel, move the cursor to the channel to be changed and press **<Enter>**.
9. To copy an existing configuration for a channel to all other channels, move the cursor to the row to be copied and type **C**.
10. To save changes, type **X**.
11. When prompted: “Update Configuration? Are you sure (Y/N)?” Type **Y**.

T-1 Configuration Manager Field Descriptions

Ch1 (Channel): This is the channel number of the port. Select any of the 14 channels to invoke and configure the T-1 Channel Configuration submenu.

Name: This is a user-defined field. Any name up to 14 characters in length can be entered to identify each port on the Quad T1. You may find it beneficial to use circuit numbers to name the ports.

Status: This field refers to the state of the T-1 circuits. You can put the T-1 circuit(s) in or out of service or alert you to a T-1 circuit(s) in or out of service.

Frm (Framing): This information must be obtained from the network supplier. Choose either D4 or ESF.

- **D4 (*SuperFrame*)** consists of 12 frames of 193 bits each for a total of 2316 bits. Each 193 bit frame consists of 192 bits preceded by one framing bit (the F bit).
- **ESF (*Extended SuperFrame*)** includes provisions for continuous monitoring by both the user and the telephone company central office. ESF provides a 4 Kbps link control channel (transparent to user data) which allows the telephone company to monitor the local loop, transmit and receive test messages and retrieve performance data, all without interrupting normal operations.

Density: This information must be obtained from the network supplier. Choose Clear or 62411. A “Clear” network imposes no “ones density” requirements on the user. A “62411” network complies with AT&T Technical Reference #62411 and limits the DNX Quad T-1 module transmission to no more than fifteen consecutive zeroes. If the Line Code entry is “B8ZS”, choose “Clear”. If the Line Code entry is “AMI”, choose 62411.

Ntwk loops: This parameter determines the T-3 module’s ability to respond to diagnostic commands received from the network supplier. Select “**Y**es” unless the commands are to be passed to another T-3 device.

Yellow alarm: “Yes” causes the T-1 module to discard data and send a “yellow alarm” if it is in a “red alarm” condition for three seconds. “Yes” must be chosen if the network supplier is a common carrier, such as a telephone company.

Format: This entry describes the types of ESF network commands that the T-1 module will respond to. It has no meaning for D4 networks. With ESF networks, this information must be obtained from the network supplier. Choose between AT&T Technical Reference 54016 and ANSI specification T1.403.

ICode: Idle Code displays whether the link is working or not. It will appear as busy (All Ones) or Idle (0).

T-1 CHANNEL CONFIGURATION

```
Eastern Research, Inc.          DNX DS3 Module - Slot:  1

                            T-1 Channel Configuration


                              Channel Nbr.: 1
                              Name........: Circuit Number
                              Framing.....: ESF
                              Status......: In Service
                              Density.....: Clear
                              Ntwk loops..: Yes
                              Yellow alarm: Yes
                              ESF format..: 54016
                              Unused DSO's: Busy









Navigate menu    = [Space/Backspace]
Change parameter = [Return/'B']
Exit/abort edits = ['X'/Esc]
```

12-5. T-1 Channel Configuration Menu.

The above screen appears when you select a port. Each of the fields shown on this menu, are described in the previous pages. ESF format and Unused DS0's are described below.

- **ESF format**: This entry describes the types of ESF network commands that the T-1 module will respond to. It has no meaning for D4 networks. With ESF networks this information must be obtained from the network supplier. Choose between AT&T Technical Reference 54016 and ANSI specification T1.403.
- **Unused DS0's**: This selection determines whether the data that will be transmitted over the unused DS0s will be "IDLE" or "BUSY".

T-3 PORT CONFIGURATION MENU

Procedure

To configure the T-3 line:

1. From the Main Menu, select Node Summary.
2. Select a Slot that has been configured for T-3.
3. From the T-3 Main Menu, select Configuration. Place your cursor on the Configuration field and press **<Enter>**.
4. From the Configuration menu select T-3 Configuration. Place your cursor on the T-3 Configuration field and press **<Enter>**. The following screen appears.

```
Eastern Research, Inc.          DNX DS3 Module - Slot:  :

                               T-3 port configuratio

Name.....................: Circuit Numbe
Unit.....................: Defl
Facility Id..............: Def - Facility Ic
Port Number..............: Def - Port No.
Generator #..............: Def - Generator No
Equipment Id.............: Def - EII
Location Id..............: Def - LII
Frame Id.................: Def - FII

M13 Operating Mode......: C-Bit Parity
Rcv Loop Timing.........: Disable
Short Cable < 50'.......: Yes
M13 Remote Loopback Type: 3rd C-Bit Inverte
Rcv AIS Selection.......: Framed 1010, C & X Bits disregarde
Xmit AIS Selection......: ANSI


Navigate menu    = [Space/Backspace]
Change parameter = [Return/'B']
Exit/abort edits = ['X'/Esc]
```

12-6. T-3 Port Configuration Menu.

5. Select T-3 multiplexing parameters from here. Refer to the field descriptions on the following page.
6. To save changes, type **X**.
7. When prompted: “Update Configuration? Are you sure (Y/N)?” Type **Y**.

T-3 Port Configuration Field Descriptions

Name: circuit identifier.

Unit: a device identifier.

Facility Id: identifies the facility where the equipment is located.

Port Number: number of the port.

Generator #: number generated.

Equipment Id: identifies the equipment in use.

Location Id: identifies where the equipment is located.

Frame Id: identifies the frame.

M13 Operating Mode: the framing selection for the DS1 to T-3 multiplexing. This can be either C-Bit or Bellcore M13.

Rcv Loop Timing: controls the T-3 transmit timing. When enabled, transmit timing is provided by T-3 receive clock. When disabled, T-3 transmit timing is provided by a free running on board oscillator.

Short Cable < 50': controls the line build out of the T-3 transmitter. Set to "Yes" when attached cable is less than 50 feet long.

M13 Remote Loopback Type: controls line codes used to set and reset DS1 remote line loopback requests. These codes cause a DS1 loopback in remote T-3 equipment or respond to codes from remote T-3 equipment. This applies to Bell Core M-13 mode only. Cbit parity has a mechanism defined by specification. Different manufacturers use different patterns in M-13 mode. The DNX T-3 option list supports a variety of codes.

Rcv AIS Selection: the received bit pattern that will cause an error.

Xmit AIS Selection: the transmitted bit pattern that will cause an error.

SELECTING T-3 AND T-1 OPTIONS

NOTE: The fields shown in this menu are the default settings and should not be accessed or configured unless you are established as a high level user (e.g., Developer); they are for debugging purposes only. It is strongly suggested that you do not tamper with these fields unless prompted to do so by an Eastern Research Technical Support Representative.

Procedure

To set options for the T-3 line and the T-3 link:

1. From the Main Menu, select Node Summary.
2. Select a Slot that has been configured for T-3.
3. From the T-3 Main Menu, select Configuration. Place your cursor on the Configuration field and press **<Enter>**. The following screen appears.

```
Eastern Research, Inc.         DNX DS3 Module - Slot:  1




                            Options menu
                            -----------
                  T1 FDL Management.............: Enabled
                  T1 Reset T1 Framer On Error...: Enabled
                  T1 One Seconds Mainatainace...: Enabled
                  T1 Ignore Rx/Tx Slips.........: No
                  T1 Link Loop Down duration....: 8
                  T3 One Seconds Mainatainace...: Enabled
                  T3 Ignore DS1 Loop Request....: No
                  Post Debug Events.............: Disabled
                  Buffer watch..................: Disabled




Navigate menu    = [Space/Backspace]
Change parameter = [Return/'B']
Exit/abort edits = ['X'/Esc]
```

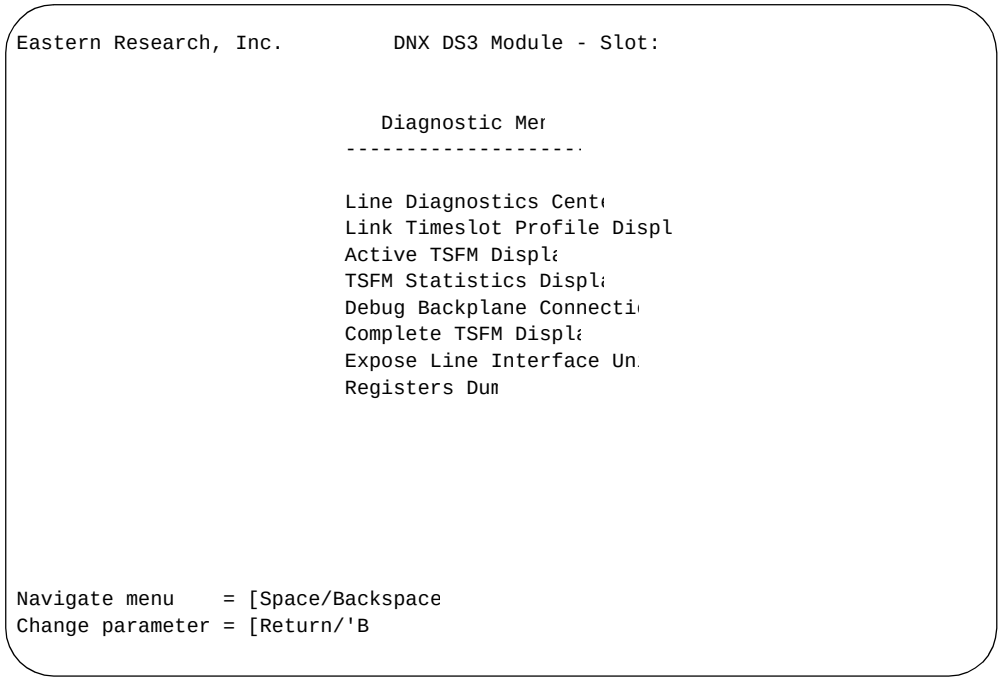
12-7. Options Menu.

T-3 MODULE DIAGNOSTICS

Procedure

To view and perform diagnostics on the T-3 module:

1. From the DNX Main Menu, select Node Summary.
2. Select a Slot that has been configured for T-3.
3. From the T-3 Main Menu, select Diagnostics. Place your cursor on the Diagnostics field and press **<Enter>**.



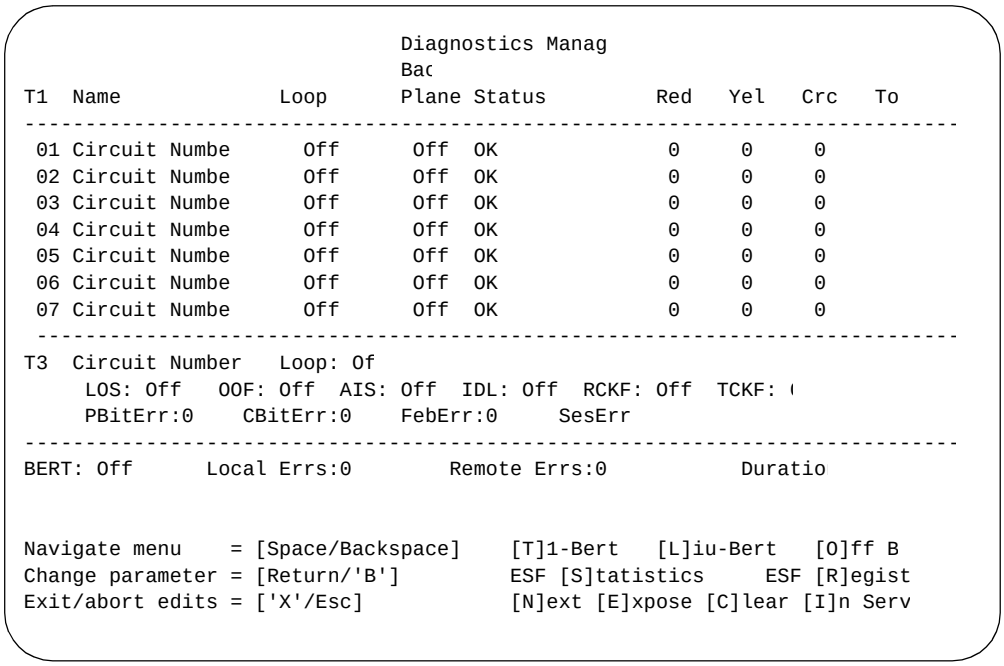
12-8. Diagnostics Menu.

DIAGNOSTICS MENU FIELD DESCRIPTIONS

Depending upon your security level, several submenus can be invoked. However, only the Line Diagnostics Center menu should be invoked for configuration purposes.

- **Line Diagnostics Center** - see next page for menu and description.
- **Link Timeslot Profile Display** displays a profile of the application card connections.
- **Active TSFM Display** shows which timeslots are currently in use.
- **TSFM Statistics Display** shows how many timeslots are not available or in use, and which links are in use.
- **Debug Backplane Connection** allows you to make loop connections on the backplane.
- **Complete TSFM Display** displays all of the information gathered from the previous screens and displays them here for a full view.
- **Expose Line Interface Unit** a diagnostic tool used to view register values associated with the rear board.
- **Registers Dump** a diagnostic tool that allows you to access registers within the Motorola processor.

LINE DIAGNOSTICS CENTER


Diagnostics Manag
Bac
T1 Name Loop Plane Status Red Yel Crc To
01 Circuit Numbe Off Off OK 0 0 0
02 Circuit Numbe Off Off OK 0 0 0
03 Circuit Numbe Off Off OK 0 0 0
04 Circuit Numbe Off Off OK 0 0 0
05 Circuit Numbe Off Off OK 0 0 0
06 Circuit Numbe Off Off OK 0 0 0
07 Circuit Numbe Off Off OK 0 0 0
T3 Circuit Number Loop: Of
LOS: Off OOF: Off AIS: Off IDL: Off RCKF: Off TCKF:
PBitErr:0 CBitErr:0 FebErr:0 SesErr
BERT: Off Local Errs:0 Remote Errs:0 Duratio
Navigate menu = [Space/Backspace] [T]1-Bert [L]iu-Bert [O]ff B
Change parameter = [Return/'B'] ESF [S]tatistics ESF [R]egist
Exit/abort edits = ['X'/Esc] [N]ext [E]xpose [C]lear [I]n Serv

12-9. Line Diagnostics Center.

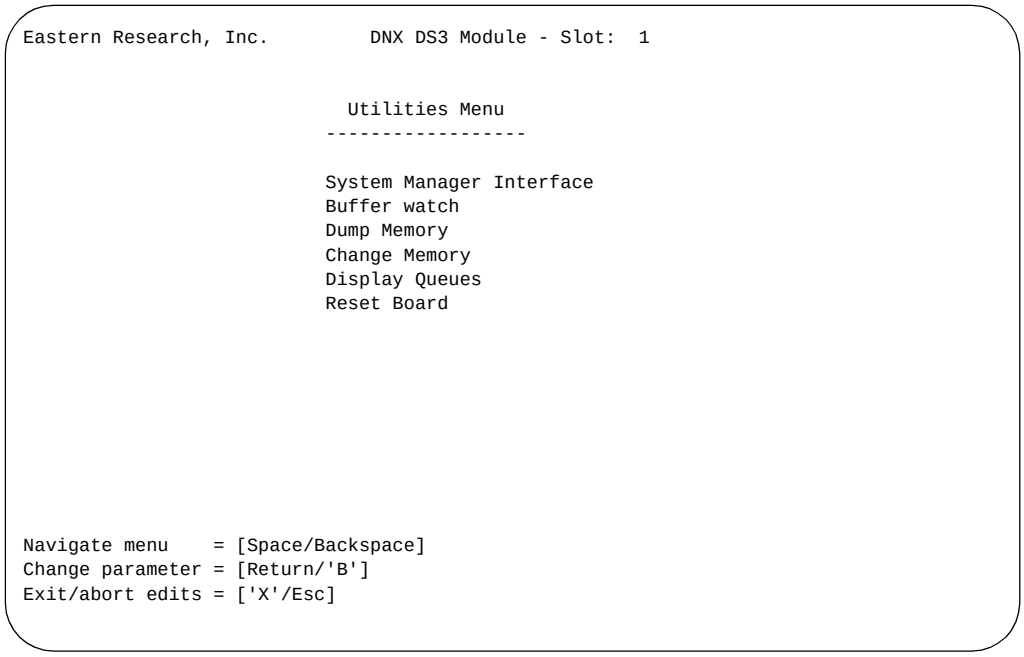
From the Line Diagnostics Center, a submenu may be viewed or invoked to perform additional diagnostic actions, such as loopbacks, and additional statistics.

T-3 MODULE UTILITIES

Procedure

To access the T-3 Utilities:

1. From the DNX Main Menu, select Node Summary.
2. Select a Slot that has been configured for T-3.
3. From the T-3 main menu, select Utilities. Place your cursor on the Utilities field and press **<Enter>**. The following screen appears.



12-10. Utilities Menu.

UTILITIES MENU FIELD DESCRIPTIONS

Depending upon your security level, several submenus can be invoked:

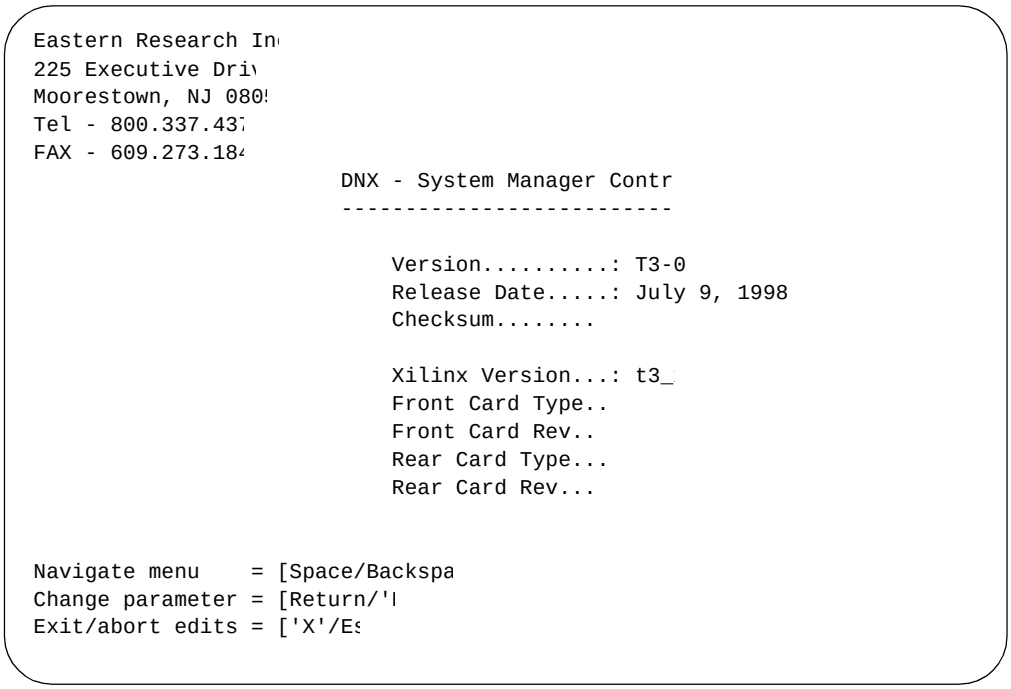
- **System Manager Interface** provides system manager statistics, such as map checksum and byte count.
- **Buffer Watch** is a way to monitor the buffers of the communications pass on the T-3 card.
- **Dump Memory** is a utility that can display a block of memory on the T-3 card.
- **Change Memory** allows you to select and modify the contents of an address on the T-3 card.
- **Display Queues** displays the operating system queues.
- **Reset Board** re-initializes the board to the start.

T-3 ABOUT MENU

Procedure

To display identification information for the T-3 module:

1. From the Main Menu, select Node Summary.
2. Select a Slot that has been configured for T-3.
3. From the T-3 Main Menu, select About. Place your cursor on the About field and press **<Enter>**. The following screen appears.



12-12. About Menu.

About Menu Field Descriptions

Version: This is the software version current in the T3's flash memory.

Release Date: The engineering release to production.

Checksum: The sum of all bytes in the T3's flash memory at power up.

XILINX Version: The hardware version of downloadable, programmable devices.

Front Card Type: Displays the type of board in the system.

Front Card Rev: Displays the board's revision level.

Rear Card Type: Displays the type of board in the system.

Rear Card Rev: Displays the board's revision level.

13 Quad OCU

Before You Begin

In order to display the Quad OCU module menus, the following must be done:

- the QHS card must be in a slot in the equipment chassis.
- slot must be configured for module type: Quad OCU.
- the *Configured Type* and *Actual Type* noted on the Node Summary Menu must be Quad OCU.

```
Eastern Research, Inc.   DNX 4 - System Manage          Help = [?]
Standby SMC not presen

                                Node Summary Me

Slot#  Configured Type   Actual Type       Stat
-----  ---------------   -----------       ----
01)    Quad T1           Quad T1           Alarm
02)    Octal T1/E1       Octal T1/E1       (
03)    Quad OCU          Quad OCU          (
04)    Octal Voice       Octal Voic




SMCA)  System Manager                      Not Prese
SMCB)  System Manager                      On Li

[C]hange slot configuration      [D]elete slot configurati
```

13-1. Node Summary Menu.

NOTE:

- **If the slot does not show a "configured type," refer to "Configuring a Slot" in Chapter 3 of this manual.**
- **This chapter is written from the perspective of the *ADMINISTRATOR* who employs the User Profile Manager Menu to add, change, or delete user information. Refer to Chapter 3 for an explanation of security levels.**
- **To access the User Profile Manager Menu, from the DNX Main Menu, select System Configuration, then select Users Menu. The Users Profile Manager Menu displays.**
- **To configure the Users Profile Manager for security purposes, navigate to the Users Menu.**

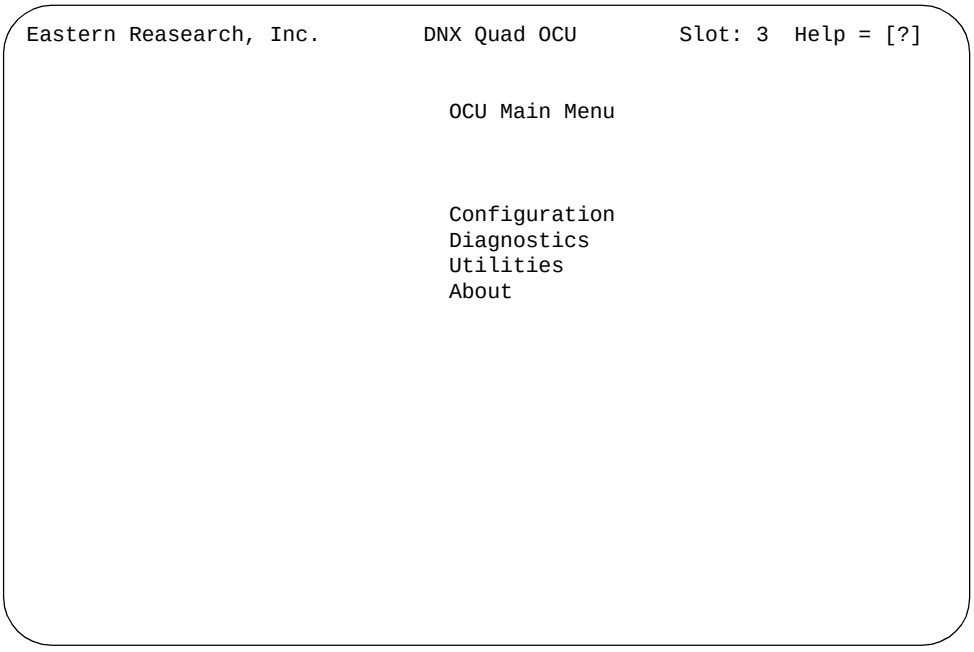
QUAD OCU MODULE MAIN MENU

The Quad OCU provides options that enable you to configure the Quad OCU module, view diagnostics, access utilities, and display version and release information.

Procedure

To configure the Quad OCU module's parameters:

1. From the Main Menu, select Node Summary.
2. Select a Slot that has been configured for Quad OCU.
3. From the OCU Main Menu, select Configuration. Place your cursor on the Configuration field and press **<Enter>**. This action will invoke a sub-menu.



13-2. Quad OCU Main Menu.

CONFIGURING QUAD OCU MODULE PARAMETERS

Procedure

To configure the Quad OCU module's parameters:

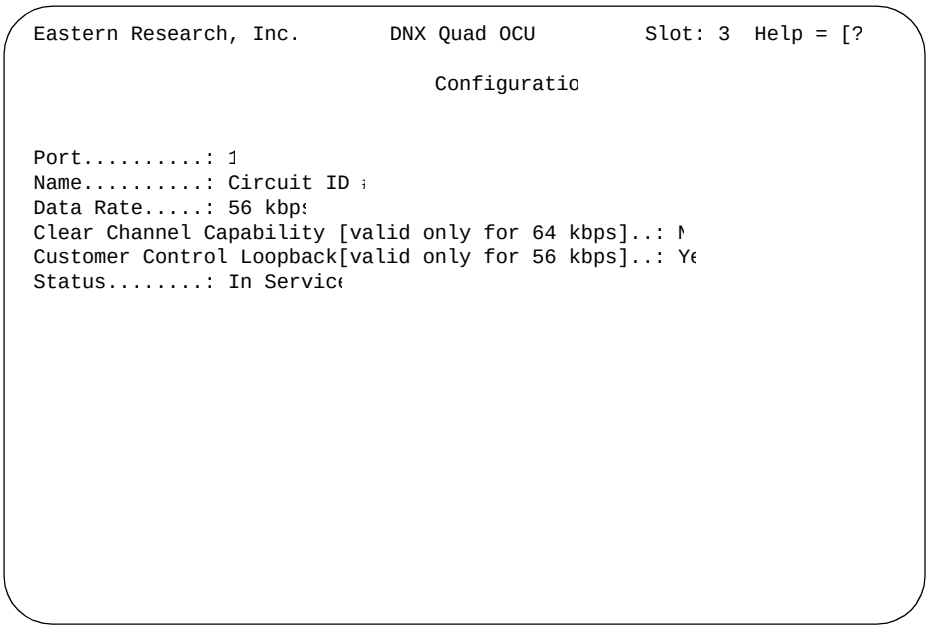
1. From the Main Menu, select Node Summary.
2. Select a Slot that has been configured for Quad OCU.
3. From the OCU Main Menu, select Configuration. Place your cursor on the Configuration field and press **<Enter>**. The following menu appears.

```
Eastern Research, Inc.       DNX Quad OCU           Slot: 3  Help = [?]

                           Configuration Manager

                                    Clear       Customer
                                    Channel     Control
Port   Name           Data Rate     Capability  Loopback  Status
-------------------------------------------------------------------
01  Circuit ID #      56 kbps     No          Yes       In Service
02  Circuit ID #      56 kbps     No          Yes       In Service
03  Circuit ID #      56 kbps     No          Yes       In Service
04  Circuit ID #      56 kbps     No          Yes       In Service
```

13-3. Configuration Manager Menu.

The Configuration Manager menu displays the port number, circuit id name, data rate, channel capability, customer control loopback, and unit status.

4. To configure each of the parameters displayed in the Configuration Manager screen, place your cursor on the desired port number, and press **<Enter>**. This action will invoke a submenu.


Eastern Research, Inc. DNX Quad OCU Slot: 3 Help = [?
Configuratio
Port.....: 1
Name.....: Circuit ID
Data Rate.....: 56 kbps
Clear Channel Capability [valid only for 64 kbps]..: N
Customer Control Loopback[valid only for 56 kbps]..: Ye
Status.....: In Service

13-4. Configuration submenu.

Procedure (cont.)

5. Modify the field data using the field descriptions that follow this text.
6. To save changes, type **X**.
7. When prompted: “Update Configuration? Are you sure (Y/N)?” Type **Y**.

CONFIGURATION MENU FIELD DESCRIPTIONS

Port #

Name: The Circuit ID # is a user-defined field. Any name up to 15 characters in length can be entered to identify each port on the Quad OCU module.

Data Rate: 64/56Kbps selectable.

Clear Channel Capability [valid only for 64 Kbps]: Select **Y**es to run clear channel.

Customer Control Loopback [valid only for 56 Kbps]: Select **Y**es, the unit will pass to the customer's loopback request or else it is converted to Control Mode Idle (CMI).

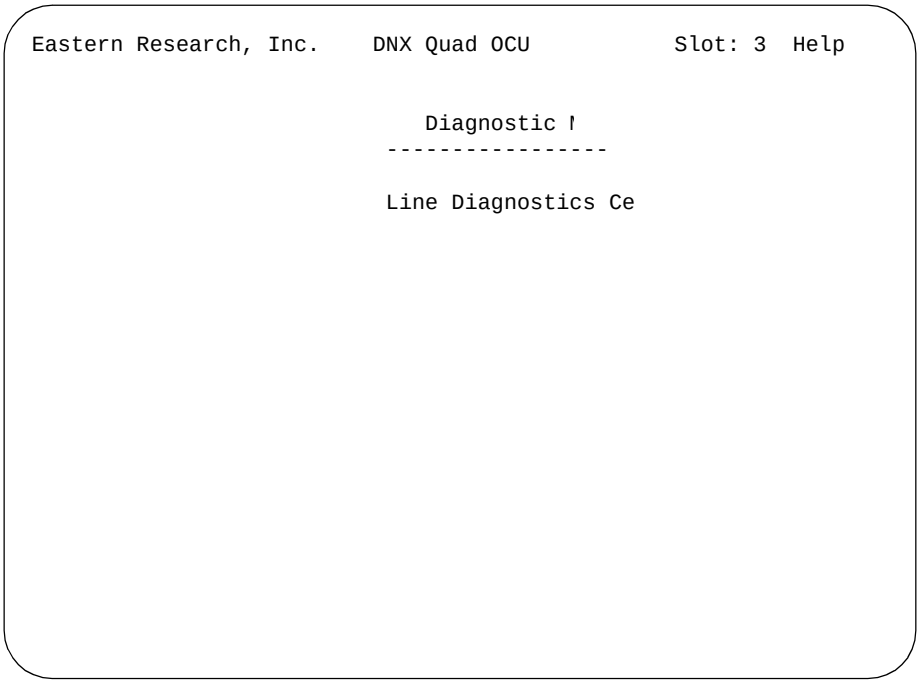
Status: The unit's status is either in service or out of service.

QUAD OCU MODULE DIAGNOSTICS

Procedure

To view Diagnostics on the Quad OCU module:

1. From the Main Menu, select Node Summary.
2. Select a Slot that has been configured for Quad OCU.
3. From the OCU Main Menu, select Diagnostics. Place your cursor on the Diagnostics field and press **<Enter>**. The following menu appears.



13-5. Diagnostics Menu.

4. Select Line Diagnostics Center to display the Diagnostics Monitor. This submenu allows you to display or perform diagnostic actions, such as loopbacks and BERT tests.

```
Eastern Research, Inc.       DNX Quad OCU          Slot: 3  Help = [?]

                              Diagnostic Monitor

Port.........: #1             #2             #3             #4
Name.........:Circuit ID #    Circuit ID #   Circuit ID #   Circuit
ID #
Port Loop.....:Off            Off            Off            Off
Backplane Loop:Off            Off            Off            Off

Bert.........:Off             Off            Off            Off
Secs.In Test..:0              0              0              0
Local Errors..:0              0              0              0
Remote Error..:0              0              0              0

State.........:LostDDS Carrier Level Detection LostDDS Carrier LostDDS
Carrier
Bipolar Error.:Yes- 32553     Yes- 33218     Yes- 32179     Yes-
31876
Loss of Frame.:No - 0         Yes- 33218     No - 0         No - 0
LineLoss db/km:50.5/8.5       32.3/5.3       50.5/8.5       50.5/8.5

Loop: Local [A]nalog     Local [D]igital    [L]ine     [R]emote
[B]ackplane
      Loop [O]ff         [C]lear Counters   Insert [E]rror
BERT: [2]047     [5]11     [6]3     All [1]'s     All [0]'s     Of[f]
```

13-6. Diagnostics Monitor Submenu.

Procedure (cont.)

5. Select the type of loopback or BERT test by the appropriate letter as indicated in the brackets, located at the bottom of the Diagnostics Monitor submenu.

DIAGNOSTICS MONITOR FIELD DESCRIPTIONS

Loopbacks

- Local **[A]**nalog
- Local **[D]**igital
- **[L]**ine
- **[R]**emote - useful for looping back any testing initiated by the other end.
- **[B]**ackplane - breaks the current data path and establishes a connection back to itself via the backplane.
- Loop **[O]**ff - normal operation has been restored.
- Clear **[C]**ounters - resets the counters
- Insert **[E]**rror

BERT test patterns

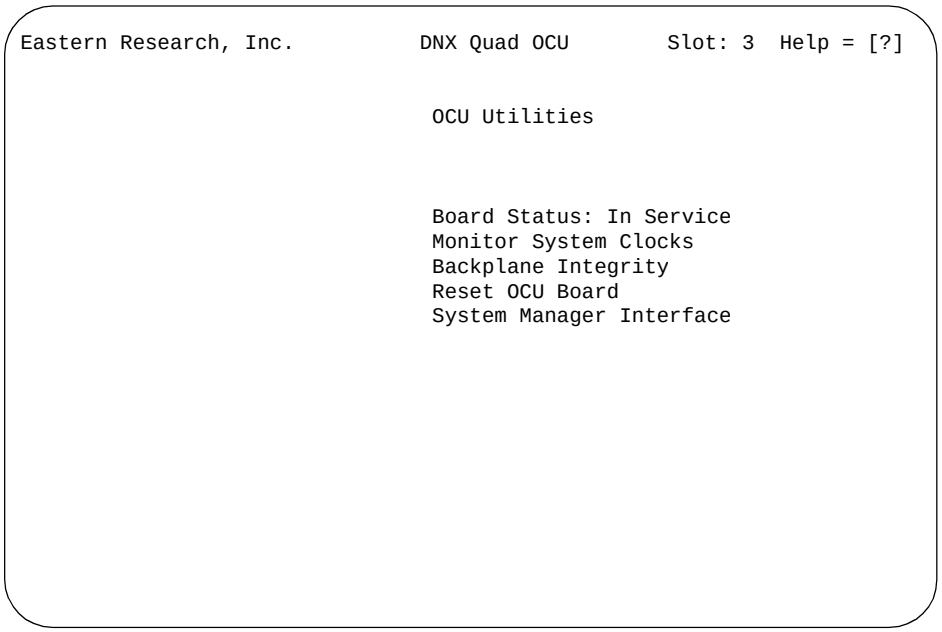
- **[2]**047
- **[5]**11
- **[6]**3
- All **[1]**’s
- All **[0]**’s
- Of**[f]**

QUAD OCU MODULE UTILITIES

Procedure

To access the Quad OCU module Utilities:

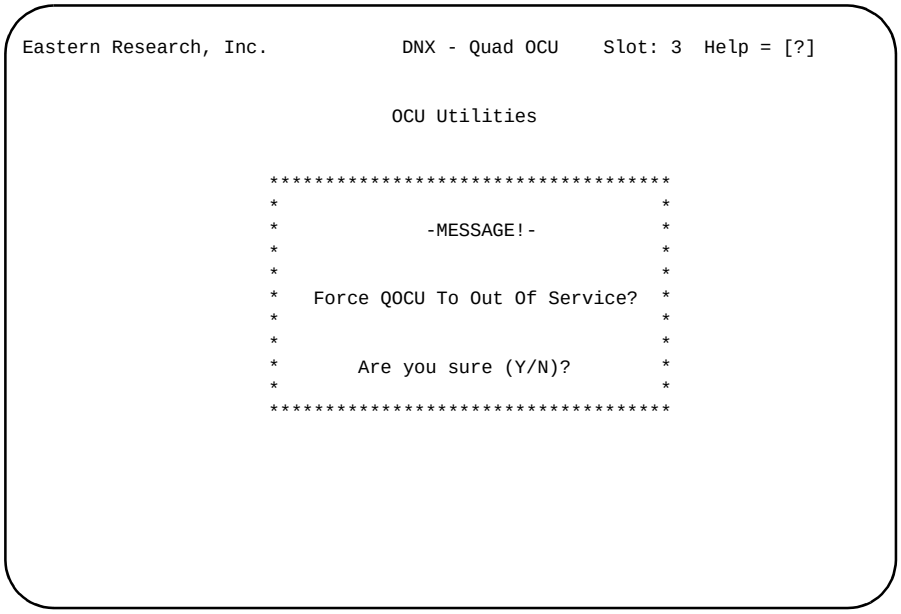
1. From the Main Menu, select Node Summary.
2. Select a Slot that has been configured for Quad OCU.
3. From the OCU Main Menu, select Utilities. Place your cursor on the Utilities field and press **<Enter>**. The following menu appears.



13-7. OCU Utilities Menu.

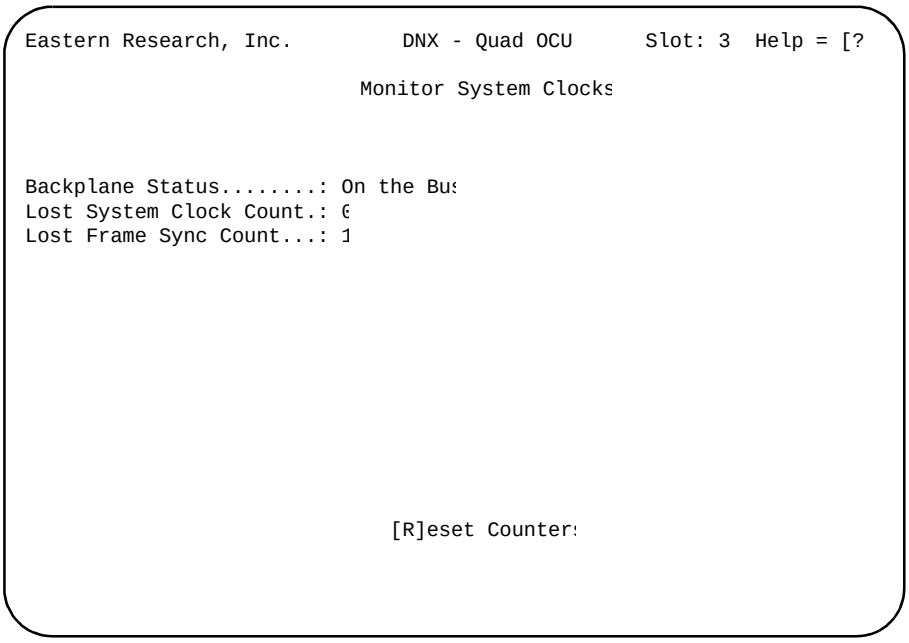
OCU UTILITIES MENU FIELD DESCRIPTIONS

- **Board Status:** Press **<Enter>** to toggle *In Service/Out Of Service.* When prompted, *"Force QOCU To Out Of Service? Are you sure (Y/N)?"* Select **Y** to acknowledge the change and **N** to remain the same.



13-8. Board Status Screen.

- **Monitor System Clocks:** Press **<Enter>** to shows status of the Buss, lost system clock count, and lost frame sync count. Counters can also be reset from here.


Eastern Research, Inc. DNX - Quad OCU Slot: 3 Help = [?
Monitor System Clocks
Backplane Status.....: On the Bus
Lost System Clock Count.: 6
Lost Frame Sync Count...: 1
[R]eset Counters

13-9. Monitor System Clocks Screen.

- **Backplane Integrity:** Press **<Enter>** to display the status of the backplane.

```
Eastern Research, Inc.          DNX - Quad OCU           Slot: 3  Help = [?]

                        Monitor Backplane Integrity

Slot #     Slot #      Slot #     Pattern    Patt.      Status
------     Address     Received   Address    Rcv    (Ignore for QHS)
Slot #1    0x00205007     01      0x00205008  03     ... OK ...
Slot #2    0x00205009     02      0x0020500a  00     ... OK ...
Slot #3    0x0020500b     03      0x0020500c  04     ... OK ...
Slot #4    0x0020500d     06      0x0020500e  06
Slot #5    0x0020500f     06      0x00205010  06
Slot #6    0x00205011     06      0x00205012  06     ... OK ...
Slot #7    0x00205013     06      0x00205014  06
Slot #8    0x00205015     06      0x00205016  06
Slot #9    0x00205017     06      0x00205018  06
Slot #10   0x00205019     06      0x0020501a  06
Slot #11   0x0020501b     06      0x0020501c  06
```

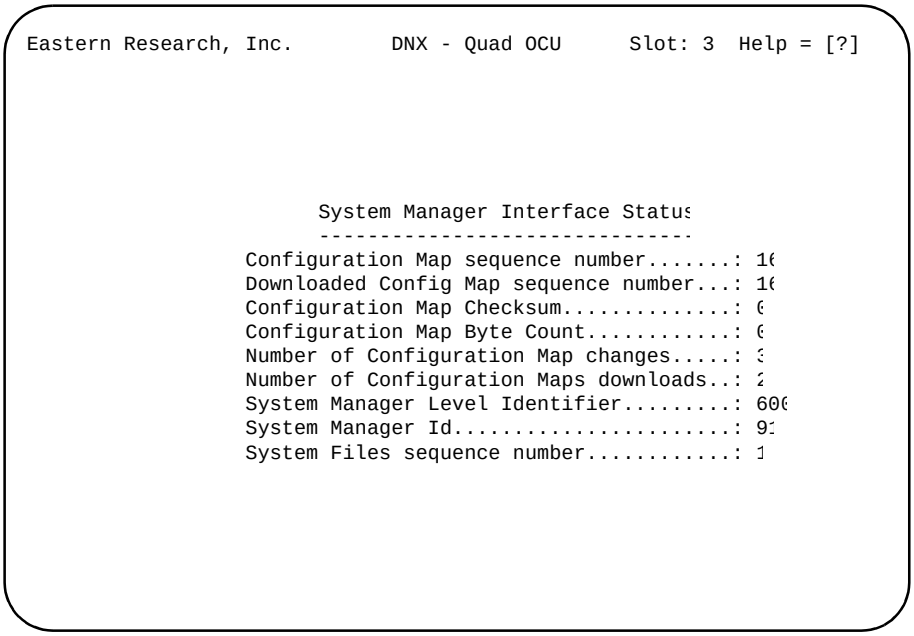
13-10. Monitor Backplane Integrity screen.

```
Eastern Research, Inc.      DNX - Quad OCU       Slot: 3  Help = [?]

                                OCU Utilities

                    **********************************
                    *
                    *              -MESSAGE!-
                    *
                    *
                    *       Reset This QOCU Board?
                    *
                    *
                    *        Are you sure (Y/N)?
                    *
                    **********************************
```

13-11. Reset QOCU Board.

- **Reset OCU Board: Press <Enter>** to re-initialize the board. When prompted, *"Reset This QOCU Board? Are you sure (Y/N)?"* Select **Y** to re-initialize the board, **N** to remain the same.

- **System Manager Interface:** Press **<Enter>** to display the status of the SMC.


Eastern Research, Inc. DNX - Quad OCU Slot: 3 Help = [?]
System Manager Interface Status
Configuration Map sequence number.....: 16
Downloaded Config Map sequence number...: 16
Configuration Map Checksum.....: 6
Configuration Map Byte Count.....: 6
Number of Configuration Map changes.....: 3
Number of Configuration Maps downloads..: 2
System Manager Level Identifier.....: 600
System Manager Id.....: 9
System Files sequence number.....: 1

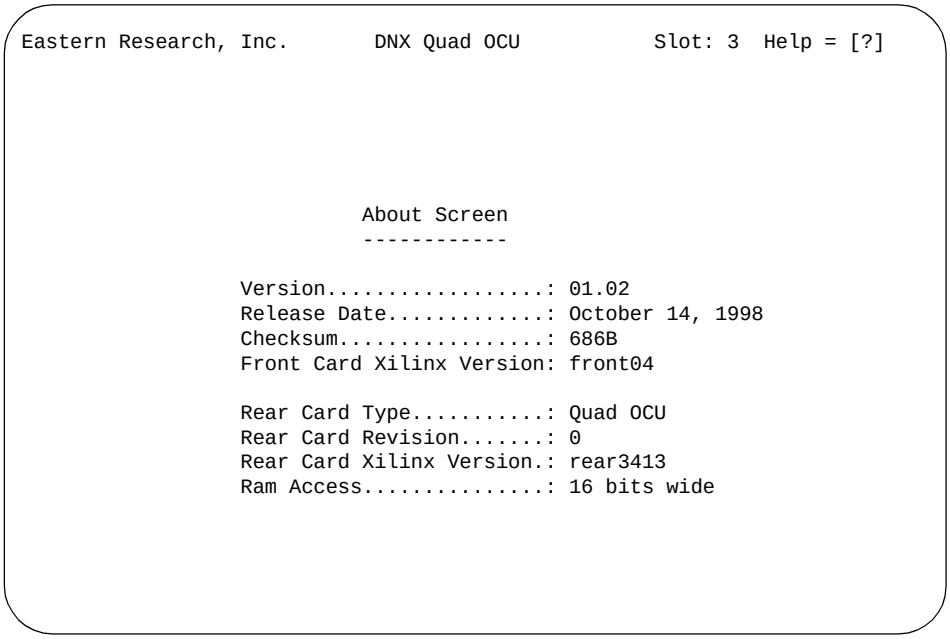
13-12. SMC Interface Status screen.

QUAD OCU ABOUT MENU

Procedure

To display identification information for the Quad OCU module:

1. From the Main Menu, select Node Summary.
2. Select a Slot that has been configured for Quad OCU.
3. From the OCU Main Menu, select About. Place your cursor on the About field and press **<Enter>**. The following screen appears.


Eastern Research, Inc. DNX Quad OCU Slot: 3 Help = [?]
About Screen
Version.....: 01.02
Release Date.....: October 14, 1998
Checksum.....: 686B
Front Card Xilinx Version: front04
Rear Card Type.....: Quad OCU
Rear Card Revision.....: 0
Rear Card Xilinx Version.: rear3413
Ram Access.....: 16 bits wide

13-13. Quad OCU About Menu.

QUAD OCU ABOUT MENU FIELD DESCRIPTIONS

Version: This is the software version current in the Quad OCU's flash memory.

Release Date: The engineering release to production.

Checksum: The sum of all bytes in the Quad OCU's flash memory at power up.

Front Card Xilink Version: The hardware version of downloadable, programmable devices.

Rear Card Type: Displays the type of board in the system.

Rear Card Type: Displays the board's revision level.

Rear Card Xilink Version: The hardware version of downloadable, programmable devices.

RAM Access: Bit width.

14 Quad T-1 with xDSL

The HDSL or High-bit-rate Digital Subscriber Line enables the transport of T-1 or Fractional T-1 data over one or two pairs of unconditioned copper. The xDSL module has the same form factor as the Quad T-1 DS1 rear card and can be implemented without any changes to the DNX system or Quad T-1 card. The xDSL module can contain up to four mini modules in any combination of Full T-1 or Fractional T-1. When used with a T-1 module, the xDSL card fits into the rear of the T-1 module, via the DNX, to extend the length of the T-1 line.

Before You Begin

In order to display the Quad xDSL menus, the following must be done:

- the Quad T-1 card must be in a slot in the equipment nest.
- the xDSL mini module must be fitted to the rear of the Quad T-1 card.
- the slot must be configured for module type: Quad T-1.
- the *Configured Type* and *Actual Type* noted on the Node Summary Menu must be Quad T-1.

```
Eastern Research, Inc.    DNX 4 - System Manager         Help = [?
Standby SMC not preser

                                 Node Summary M

Slot#  Configured Type   Actual Type       Sta
-----  ---------------   -----------       ---
01)    Quad T1           Quad T1           Alar
02)    Octal T1/E1       Octal T1/E1
03)    Quad OCU          Quad OCU
04)    Octal Voice       Octal Voi









SMCA)  System Manager                      Not Pres
SMCB)  System Manager                      On L

[C]hange slot configuration      [D]elete slot configura
```

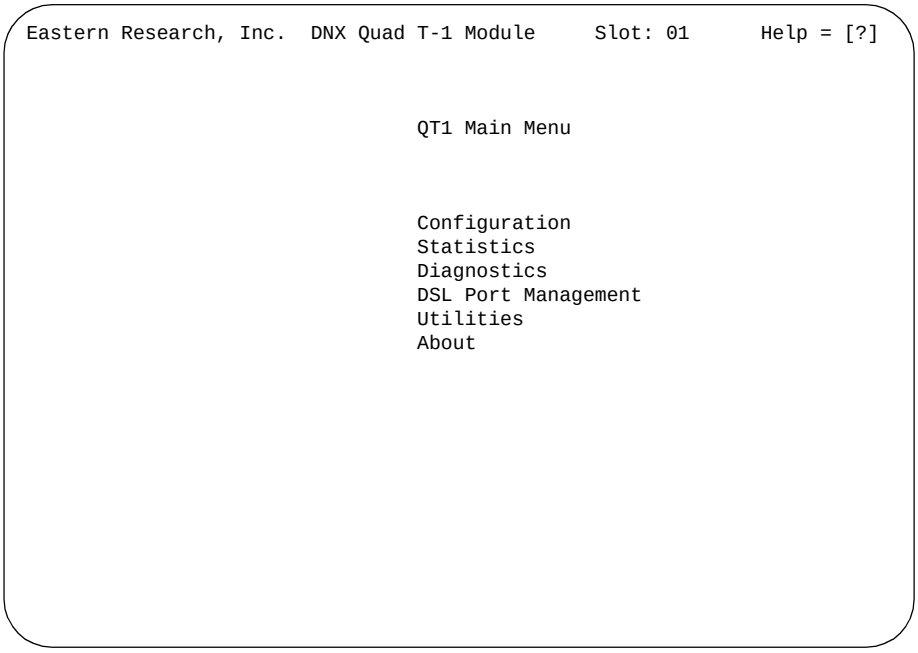
14-1. Node Summary Menu.

NOTE:

- **If the slot does not show a "configured type," refer to "Configuring a Slot" in Chapter 3 of this manual.**
- **This chapter is written from the perspective of the *ADMINISTRATOR* who employs the User Profile Manager Menu to add, change, or delete user information. Refer to Chapter 3 for an explanation of security levels.**
- **To access the User Profile Manager Menu, from the DNX Main Menu, select System Configuration, then select Users Menu. The Users Profile Manager Menu displays.**
- **To configure the Users Profile Manager for security purposes, navigate to the Users Menu.**

QUAD T-1 MAIN MENU

The Quad T-1 Main menu provides options that enable you to configure the Quad T-1 module, retrieve statistics, view diagnostics, manage DSL ports, access utilities, and display version and release information.



14-2. Quad T-1 Main Menu with DSL Port Management.

QUAD T-1 WITH XDSL MODULE CONFIGURATION

NOTE: The Quad xDSL configuration files are stored on the System Controller. Thus, when replacing a Quad T-1 card, the old configuration will be preserved.

Procedure

To configure parameters for the Quad T-1 with xDSL module:

1. From the Main Menu, select Node Summary
2. Select a slot that has been configured for Quad T-1.
3. From the Quad T-1 Main Menu, select Configuration. Place your cursor on the Configuration field and press **<Enter>**. The following screen appears.

```
Eastern Research, Inc.    DNX Quad T-1 Module Slot: 01      Help = [?

                        Quad T-1 card port configurati

              Port #1        Port #2        Port #3        Port
Name........: Port #1        Port #2        Port #3        Port
Framing.....: ESF            ESF            ESF            E
Line code...: B8ZS           B8ZS           B8ZS           B8
LBO.........: 0 db           0 db           0 db           0
Density.....: Clear          Clear          Clear          Cle
Ntwk loops..: Enable         Enable         Enable         Enal
Yellow alarm: Yes            Yes            Yes            Y
ESF format..: 54016          54016          54016          54(
Unused DSO's: Busy           Busy           Busy           Bu
Port Status : In Service     In Service     In Service     In Serv
HDSL Unit...: Master         Master         Master         Mas
Cascade Leds when Idle: Ye
```

14-3. Quad T-1 Card Port Configuration Menu.

4. Configure all parameters for each port (refer to the field descriptions that follow).
5. To save changes, type **X**.
6. When prompted: “Update Configured? Are you sure (Y/N)?” Type **Y**.

Quad T-1 Card Port Configuration Field Descriptions

Name: (text field) This is a user-defined field. Any name up to 14 characters in length can be entered to identify each port on the Quad T-1. Some users find it beneficial to use circuit numbers to name the ports.

Framing: (option field) This information must be obtained from the network supplier. Choose either D4 or ESF.

> ***D4 (Super Frame):*** D4 (SuperFrame) consists of 12 frames of 193 bits each for a total of 2316 bits. Each 193 bit frame consists of 192 bits preceded by one framing bit (the F bit).
>
> ***ESF (Extended Super Frame):*** ESF (Extended SuperFrame) includes provisions for continuous monitoring by both the user and the telephone company central office. ESF provides a 4 Kbps link control channel (transparent to user data) which allows the telephone company to monitor the local loop, transmit and receive test messages and retrieve performance data, all without interrupting normal operations.

Line Code: (option field) This information must be obtained from the network supplier. Choose between AMI (Alternate Mark Inversion) and B8ZS (Bipolar with 8 Zero Substitution).

LBO (Line Build Out): (option field) This parameter should be set to 0 dB unless the network supplier specifically requests otherwise. The options are 0, 7.5, 15 or 22 dB.

Density: (option field) This information must be obtained from the network supplier. Choose Clear or 62411. A “Clear” network imposes no “ones density” requirements on the user. A “62411” network complies with AT&T Technical Reference #62411 and limits the DNX Quad T-1 module transmission to no more than fifteen consecutive zeroes. If the Line Code entry is “B8ZS”, choose “Clear”. If the Line Code entry is “AMI”, choose 62411.

Network Loops: (option field) This entry determines the T-1 module’s ability to respond to diagnostic commands received from the network supplier. Select “no” so that the commands are passed to another T-1 device that will respond. This will prevent the local T1 from detecting the command during xDSL initialization and thus turn on the LOOP LED.

Yellow Alarm: (option field) “Yes” causes the T-1 module to discard data and send a “yellow alarm” if it is in a “red alarm” condition for three seconds. “Yes” must be chosen if the network supplier is a common carrier, such as a telephone company.

ESF Format: (option field) This entry describes the types of ESF network commands that the T-1 module will respond to. It has no meaning for D4 networks. With ESF networks, this information must be obtained from the network supplier. Choose between AT&T Technical Reference 54016 and ANSI specification T1.403.

Unused DS0s: (option field) This selection determines whether the data that will be transmitted over the unused DS0s will be “IDLE” or “BUSY.”

Port Status: (option field) This field determines the status of the port. The status will either be “in service” or “out of service”.

HDSL Unit: (option field) Master and slave are the two options for an xDSL span. As a master it provides clock to the far end slave unit. As a slave unit it accepts clock from the far end master unit. System clocking must be set to this port.

Cascade LEDs when idle: Blinking LEDs that indicate the board is working but it is in idle mode.

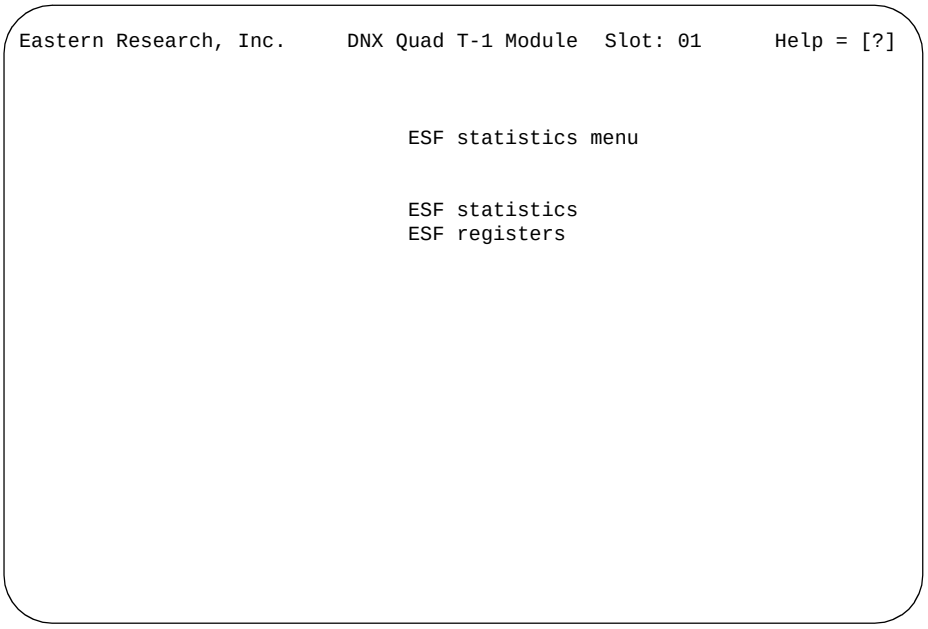
ESF STATISTICS

The ESF Statistics menu displays both current and 24-hour ESF statistics. The “Current Statistics” column displays the counts for the current time interval (maximum fifteen minutes). The 24-Hour Statistics” column displays the counts for the preceding 24-hour period.

Procedure

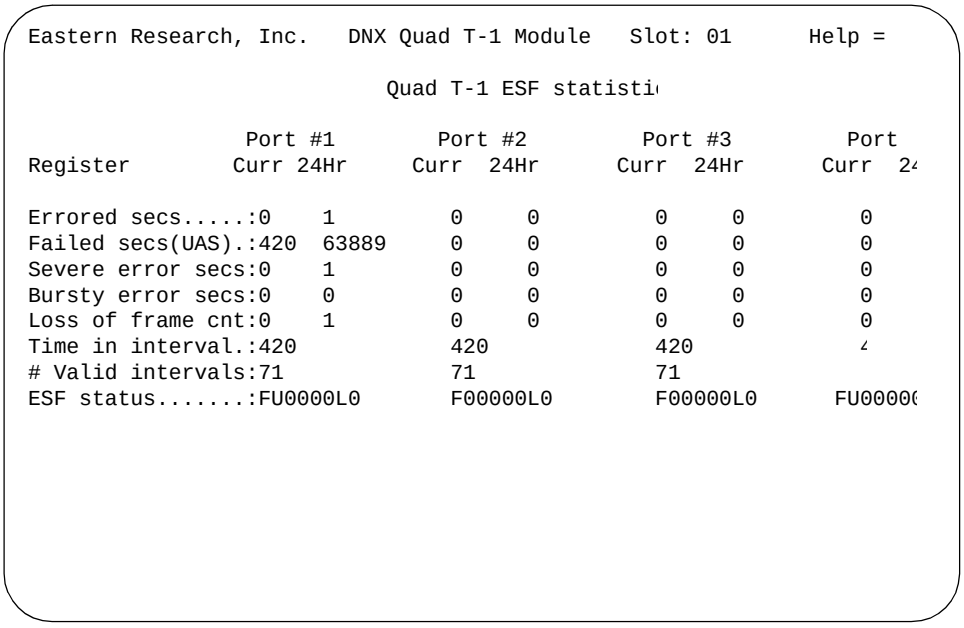
To view the ESF Statistics for the Quad T-1 module:

1. From the DNX Main Menu, select Node Summary.
2. Select a Slot that has been configured for Quad T-1.
3. From the Quad T-1 menu, select Statistics. Place your cursor on the Statistics field and press **<Enter>**. The following screen appears.



14-4. ESF Statistics Menu.

4. From the ESF Statistics Menu, select ESF Statistics. Place your cursor on the ESF Statistics field and press **<Enter>**. The following screen appears.


Eastern Research, Inc. DNX Quad T-1 Module Slot: 01 Help =
Quad T-1 ESF statisti
Register
Port #1 Curr 24Hr
Port #2 Curr 24Hr
Port #3 Curr 24Hr
Port Curr 2
Errored secs.....:0 1 0 0 0 0 0
Failed secs(UAS).:420 63889 0 0 0 0 0
Severe error secs:0 1 0 0 0 0 0
Bursty error secs:0 0 0 0 0 0 0
Loss of frame cnt:0 1 0 0 0 0 0
Time in interval.:420 420 420 4
Valid intervals:71 71 71
ESF status.....:FU0000L0 F00000L0 F00000L0 FU0000

14-5. ESF Statistics screen.

5. To exit or return to the previous menu, type **X** or press **Esc**.

ESF Statistics Field Descriptions

Errored Second (ES): The occurrence of a Loss of Frame or a CRC6 error in a one-second period is known as an errored second. This field represents the number of errored seconds that have occurred.

Failed Second (FS): Each second period during the occurrence of a Failed Signal State (ten consecutive errored seconds) is known as a failed second. This field represents the number of failed seconds that have occurred.

Severely Errored Second (SES): A one-second period in which three hundred twenty (320) or more CRC6 errors have occurred is known as a severely errored second. This field represents the number of severely errored seconds that have occurred.

Bursty Errored Second (BES): A one-second period in which more than one but less than 320 CRC6 errors has occurred is known as a bursty errored second. This field represents the number of bursty errored seconds that have occurred.

Loss of Frame Count: A loss of frame occurs when either Network equipment or the DTE senses errors in the framing pattern. Depending upon the equipment, this occurs when any 2 of 4, 2 of 5, or 3 of 5 consecutive terminal framing bits received contain bit errors in the framing pattern.

Time In Interval: A timer that tracks the number of seconds in one 15-minute interval.

# of Valid Intervals: A counter that tracks the total number of 15 minute intervals in a 24 hour period (up to 96).

ESF Status: This field defines the status of the T1 line. The status is defined by an eight digit number that is described below:

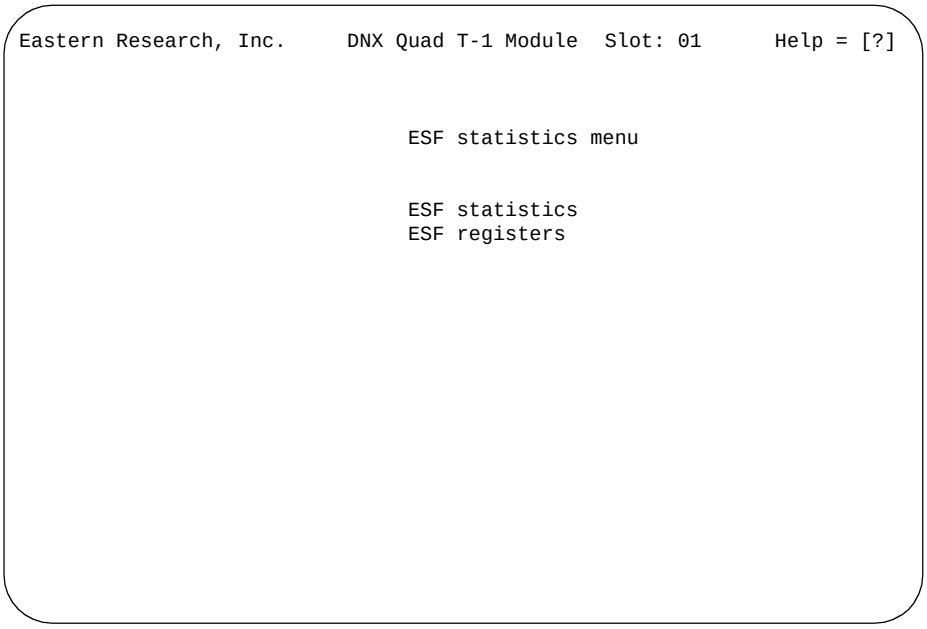
FU0000L0
Digit #1 - “F” or “0” where “F” indicates Failed Signal State (FSS) if “U” or “L” is true.
Digit #2 - “U” or “0” where “U” indicates an unavailable signal state.
Digit #3 through #6 and #8 are always “0.”
Digit #7 - “L” or “0” where “L” indicates that the T1 line is in loop.

ESF REGISTERS

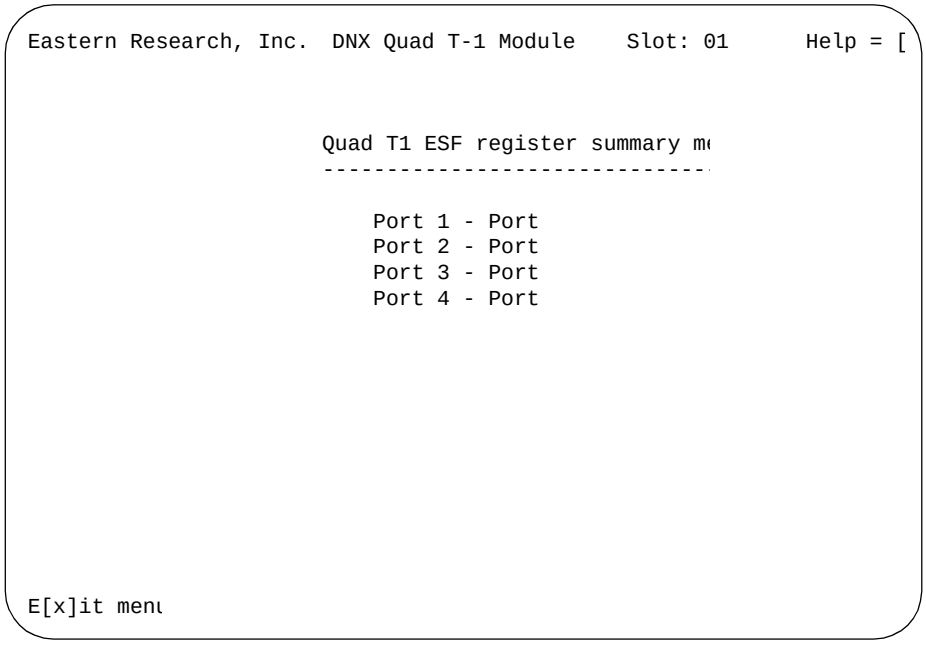
The ESF Registers Menu gives the same information as the ESF Statistics Menu but it is broken down by port for each of the ninety-six 15-minute intervals in the preceding 24-hour period.

Procedure

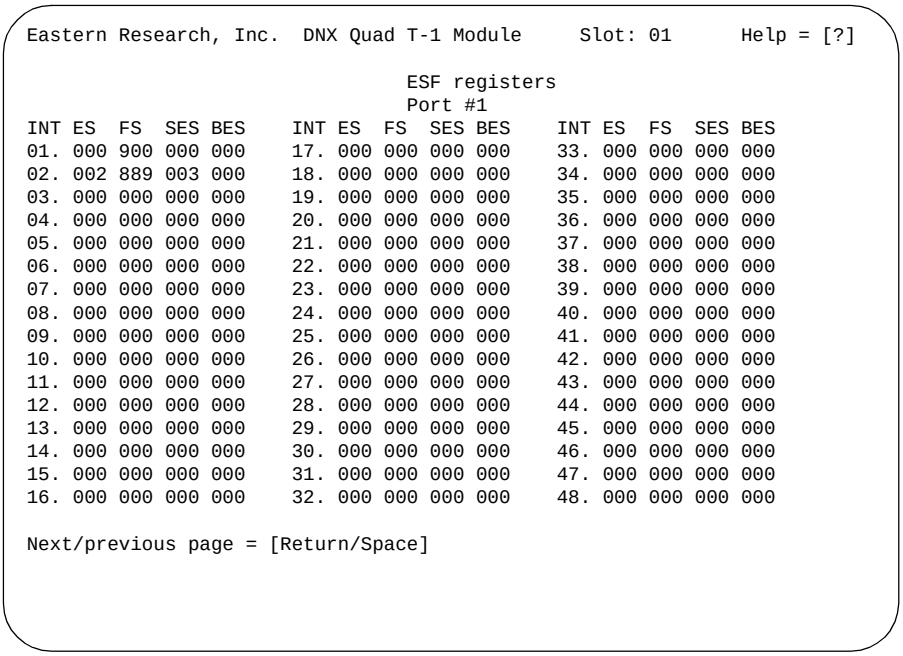
1. From the DNX Main Menu, select Node Summary.
2. Select a Slot that has been configured for Quad T-1.
3. From the Quad T-1 menu, select Registers. Place your cursor on the Registers field and press **<Enter>**. The following screen appears.



14-6. ESF Statistics screen.


Eastern Research, Inc. DNX Quad T-1 Module Slot: 01 Help = [
Quad T1 ESF register summary m
Port 1 - Port
Port 2 - Port
Port 3 - Port
Port 4 - Port
E[x]it menu

14-7. ESF Registers Summary screen.



14-8. ESF Registers displayed.

ESF Registers Field Descriptions

Errored Seconds (ES): The occurrence of a Loss of Frame or a CRC6 error in a one-second period is known as an errored second. This field represents the number of errored seconds that have occurred.

Failed Second (FS): Each second period during the occurrence of a Failed Signal State (ten consecutive errored seconds) is known as a failed second. This field represents the number of severely errored seconds that have occurred.

Severely Errored Second (SES): A one-second period in which three hundred twenty (320) or more CRC6 errors have occurred is known as a severely errored second. This field represents the number of severely errored seconds that have occurred.

Bursty Errored Seconds (BES): A one-second period in which more than one but less than 320 CRC6 errors has occurred is known as a bursty errored second. This field represents the number of bursty errored seconds that have occurred.

QUAD T-1 MODULE DIAGNOSTICS

Procedure

To view Diagnostics on the Quad T-1 module, follow these steps:

1. From the DNX Main Menu, select Node Summary.
2. Select a Slot that has been configured for Quad T-1.
3. From the Quad T-1 menu, select Diagnostics. Place your cursor on the Diagnostics field and press **<Enter>**. The following screen appears.

```
Eastern Research, Inc.   DNX Quad T-1 Module    Slot: 01      Help = [?]

Quad T-1 diagnostics


NI BERT........: Off             Off             Off             Off
Error seconds..: 0               0               0               0
Seconds in test: 0               0               0               0

               State ErrSec   State ErrSec   State ErrSec   State ErrSec
AIS............: Yes  2602     No   0          No   0          No   0
RED............: Yes  2605     No   0          No   0          No   0
YEL............: No   0        Yes  2605       Yes  2605       Yes  2605
Ferr...........: Yes  2604     No   0          No   0          No   0
CRC6...........: Yes  2604     No   0          No   0          No   0
BPV............: No   6        Yes  2605       No   0          No   0
LOS............: No   4        Yes  2605       Yes  2605       Yes  2605

***Access the DSL Port Menu for all Loopback Commands!



[R]eset counts     Insert Bert [E]rrors
```

14-9. Quad T-1 Diagnostics Menu.

4. For ports 1 through 4, select one of the following test patterns:
   - 2047
   - 3 of 24
   - All Ones
   - All 0’s
   - QRSS
   - **NI BERT:** This is useful for testing the bit error rate of the communication circuit via the NI. The device checks for errors by comparing a received data pattern with a known transmitted data pattern to determine line quality.
   - **Error seconds:** This read-only count represents the number of errored seconds that occurred in a one second period while the Quad T-1 module was in test.
   - **Seconds in test:** This read-only count represents the number of seconds the Quad T-1 module was in test.

AIS: An unframed “all ones” condition has been detected.

Red Alarm (RED): A “loss of frame alignment” has occurred and synchronization has been lost.

- **Yellow Alarm (YEL):** A Yellow Alarm is generated by the network and sent to the customer premises. It usually means that the network is not receiving the DNX signaling correctly. (The network is not in sync or a red alarm has occurred.)
- **Framing Errors (Ferr):** One or more frame alignment bit errors have been detected. This does not mean that synchronization has been lost.
- **CRC6 Alarm:** One or more CRC6 block errors have been detected. The D4 framing does not include CRC6; the DNX T-1 Quad module replaces that parameter by counting the number of framing bit errors. The result is a useful picture over time regarding D4 link performance.
- **BPV:** Bipolar Violations have been detected. This usually indicates that a very weak or excessively strong signal is being received from the network.
- **LOS:** This indicates a loss of signal detection. No signal is present on the RX pair to the DNX T-1 module. (T-1 loop)

5. Choose one of the following actions to:

- reset counts, type **R**.
- insert BERT errors, type **E**.
- save changes and exit to the previous menu, type **X**.

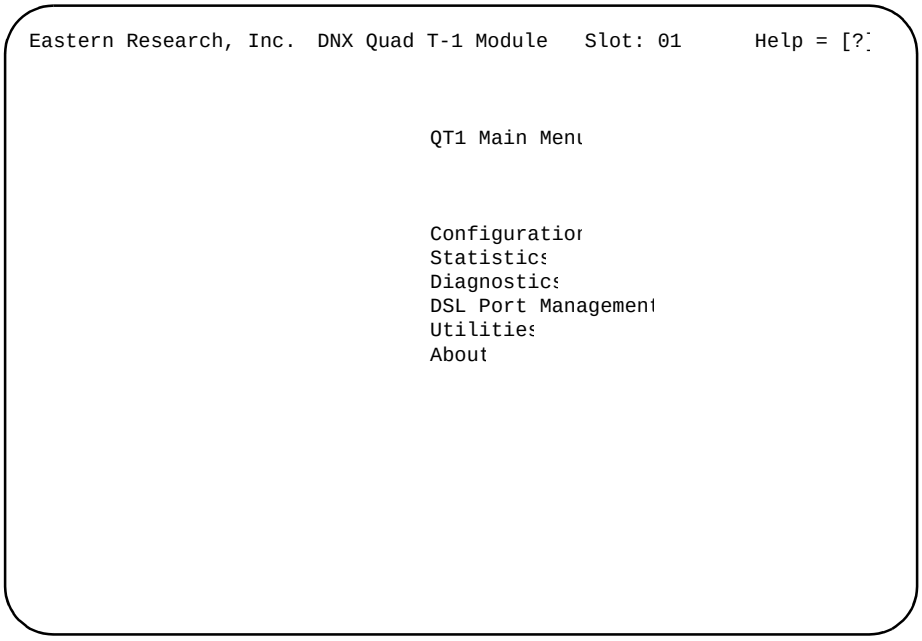
6. When done, go to the DSL Port Management Menu to set up loopback commands.

DSL PORT MANAGEMENT FOR THE QUAD T-1 WITH XDSL MODULE

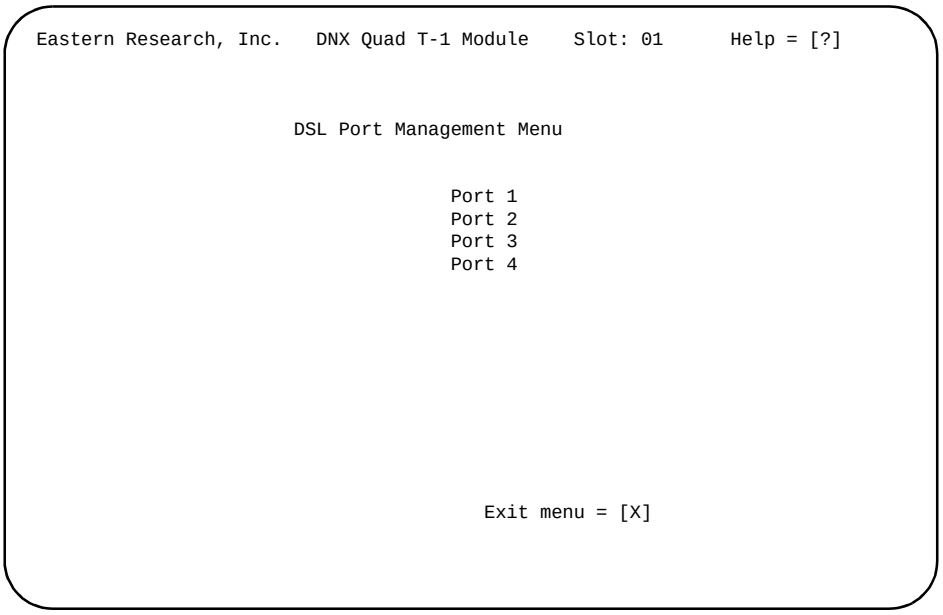
Procedure

To configure or view parameters for the xDSL mini module:

1. From the DNX Main Menu, select Node Summary.
2. Select a Slot that has been configured for Quad T-1.
3. From the Quad T-1 menu, select DSL Port Management. Place your cursor on the DSL Port Management field and press **<Enter>**. The following screen appears.



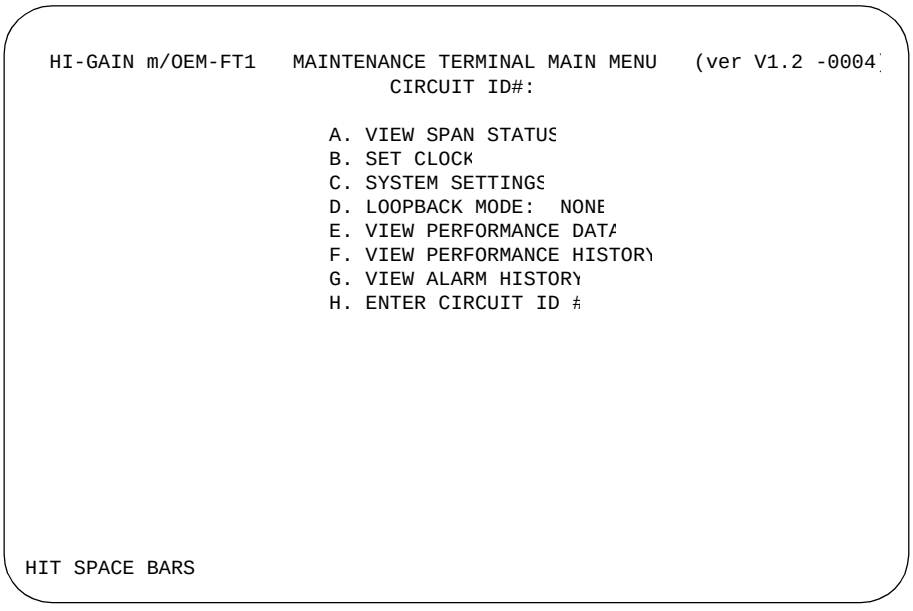
14-10. Quad T-1 Main Menu.



14-11. DSL Port Management Menu.

Procedure (cont.)

4. At the DSL Port Management menu, place your cursor on one of the four ports and press **<Enter>**. A message appears prompting you to **"HIT SPACE BARS."**
5. Press the **SPACE BAR** twice to access the next menu, which is the Maintenance Terminal Main Menu. There are eight lettered submenus on the Maintenance Terminal Main Menu that allow you to view or configure various parameters on the xDSL mini module.


HI-GAIN m/OEM-FT1 MAINTENANCE TERMINAL MAIN MENU (ver V1.2 -0004)
CIRCUIT ID#:
A. VIEW SPAN STATUS
B. SET CLOCK
C. SYSTEM SETTINGS
D. LOOPBACK MODE: NONE
E. VIEW PERFORMANCE DATA
F. VIEW PERFORMANCE HISTORY
G. VIEW ALARM HISTORY
H. ENTER CIRCUIT ID #
HIT SPACE BARS

14-12. Maintenance Terminal Main Menu.

Command keys

When you select one of the submenus (A-H) from the Maintenance Terminal Main Menu, a list of commands appears near the bottom of the screen. The most common are listed below. Additional commands are listed on sub-menus.

Menu Actions for Maintenance Terminal Submenus

Action	Key
Exit screen	**E**
Clear the read-only error counters	**C**
Update the screen	**U**
Return to the DSL Port Management Menu	**Ctrl Z**
Return to the Node Summary Menu	**Ctrl Z**

View Span Status Screen

Select **A** from the Maintenance Terminal Main Menu and the View Span Status screen appears. From here, you can observe the condition or status of the copper pair that goes from the local unit to the remote unit. These conditions may be observed over a 24-hour period.

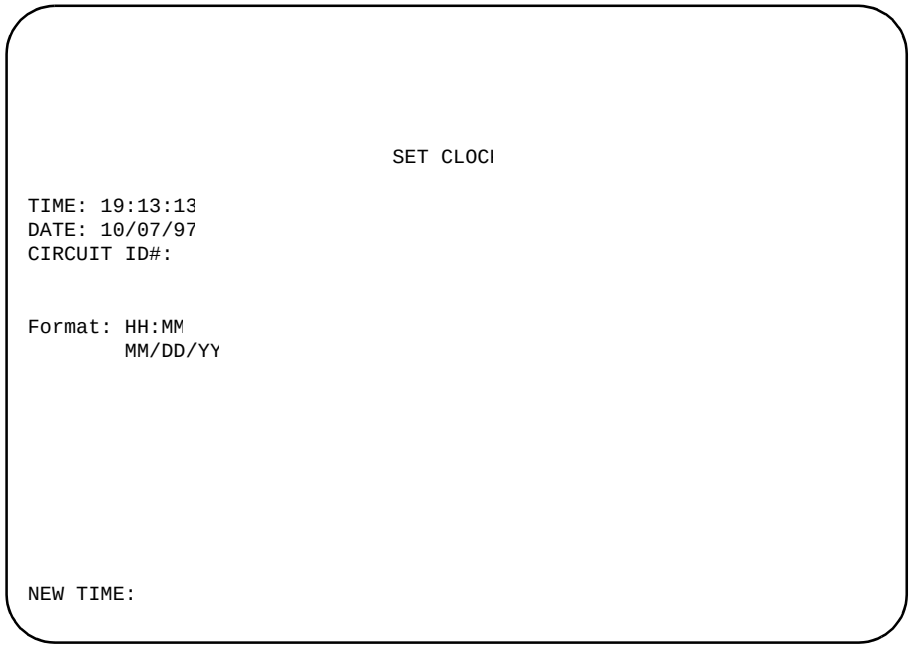
```
                              SPAN STATUS
                    ( HLU/ver1.2-0004: HRU/ver0.0-0000)
TIME: 00:50:17
DATE: 07/13/97                      CIRCUIT ID#:

ALARMS:   LAIS LOSW
LOOPBACK: OFF
                               HLU                  HRU
                              HDSL                 HDSL
                          cur/min/max          cur/min/max
MARGIN:                        N/A                  N/A   dB
PULSE ATTN:                    N/A                  N/A   dB
PPM OFFSET:                    N/A                  N/A   ppm
24 HOUR ES:                  00000                00000   seconds
24 HOUR UAS:                 03017                00000   seconds

                                      DS1 STATUS
                               HLU                  HRU
24 HOUR BPV Seconds:         00001                00000
24 HOUR UAS Count:           00000                00000
Frame type:                   ESF                  N/A
Code type:                    AMI                  N/A

                          (E)xit (C)lear (U)pdate
```

14-13. View Span Status Screen.

Margin: causes an Alarm Event and causes Front Bezel Alarm LED to flash if below the default threshold of 4DB.

Set Clock Menu

Select **B** from the Maintenance Terminal Menu and the Set Clock menu appears. From here, you can set the time and date. Enter the hour and minutes; seconds are optional. Press **<Enter>** to confirm the time and date selections.



14-14. Set Clock Screen.

System Settings Menu

Select **C** from the Maintenance Terminal Main Menu and the System Settings menu appears.

To change a setting, type the letter shown in parentheses. This action will cause the screen to refresh and then reflect the new information.

After all parameters have been set, press **E** to exit, and **C** to confirm your entries. The new parameters are now activated.

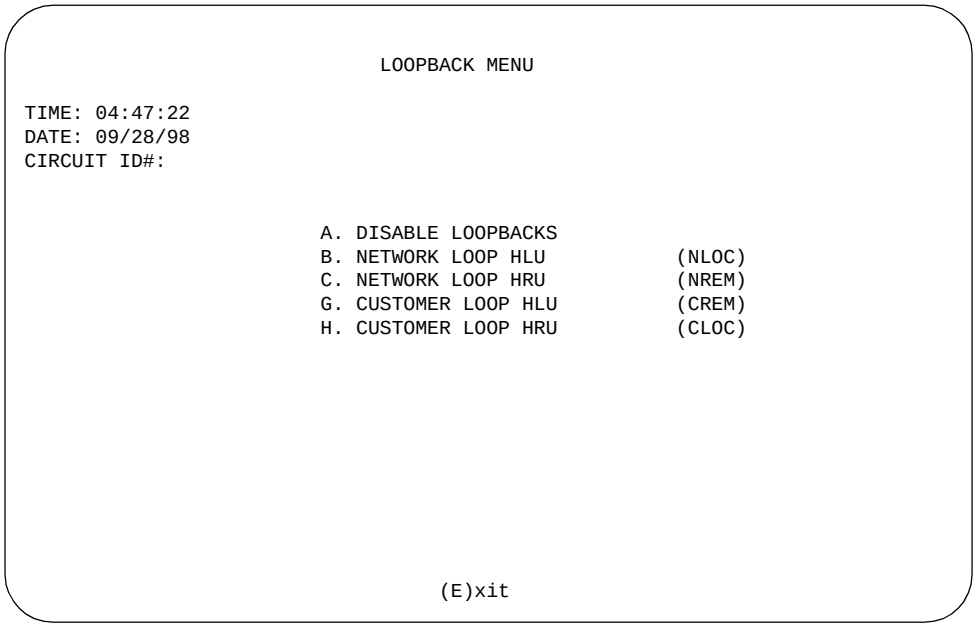
NOTE: The System Settings menu is void of letters in parenthesis and nonconfigurable if the port is set for Slave in the T1 configuration menu.

```
                                SYSTEM SETTING

TIME: 00:52:12
DATE: 07/13/97                      CIRCUIT ID#


SMART-JACK (L)B:    ENABLE
(S)PECIAL LPBK:     GNLE
(Z)BTSI:            OFF
ES ALARM TH(R)ES:   NONE
LOOPBACK (T)IMEOUT: 60
(A)LARM:            ENABLE
(D)S1 LINE CODE:    AUTO
(F)RAMING:          AUTO
AIS ON (H)DSL ALRM: ENABLE
AIS ON S(M)JK/NREM: ENABLE
MAR(G)IN ALM THRES: 4
DSO (B)LOCKING: xx - Blocked Channel
01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 2
                                    xx xx xx xx xx xx xx xx xx xx xx x

                                (E)xit
     Enter the letter in parenthesis (X) to change any settir
```

14-15. Option C - System Settings Screen.

Loopback Menu

Select **D** from the Maintenance Terminal Main Menu and the Loopback Mode menu appears. From here you can enable/disable loopbacks; set the network loop for the local or remote site; or set the customer loop for the local or remote locations.



14-16. Option D - Loopback Menu.

View Performance Data Menu

Select **E** from the Maintenance Terminal Main Menu and the View Performance Data menu appears. This screen shows the errored and unavailable seconds for both HDSL loops and each T-1 input over a specified period of time.

```
Date: 09/28/98           PERFORMANCE [
CIRCUIT ID#
                  ERRORED SECONDS/UNAVAILABLE SE(

               DS1              H
          HLU      HRU      HLU
19:30    000/000  000/000  000/900  000,
19:45    000/000  000/000  000/900  000,
20:00    000/000  000/000  000/900  000,
20:15    000/000  000/000  000/900  000,
20:30    000/000  000/000  000/900  000,
20:45    000/000  000/000  000/900  000,
21:00    000/000  000/000  000/900  000,
21:15    000/000  000/000  000/900  000,
21:30    000/000  000/000  000/900  000,
21:45    000/000  000/000  000/900  000,
22:00    000/000  000/000  000/900  000,
22:15    000/000  000/000  000/900  000,
22:30    000/000  000/000  000/900  000,
22:45    000/000  000/000  000/900  000,
23:00    000/000  000/000  000/900  000,
23:15    000/000  000/000  000/900  000,

                       (E)xit (P)revious (N
```

14-17. Option E - View Performance Data Menu.

Performance History Menu

Select **F** from the Maintenance Terminal Main Menu and the View Performance History menu appears. This screen shows the errored and unavailable seconds for both HDSL loops and each T-1 input are listed for the current and previous seven days.

```
Time: 19:23:49                                  7 DAY HISTORY
CIRCUIT ID#:


                        ERRORED SECONDS/UNAVAILABLE SECONDS

                DS1                     HDSL
            HLU         HRU         HLU         HRU
09/30   00000/00000 00000/00000 00000/00000 00000/00000
10/01   00000/00000 00000/00000 00000/00000 00000/00000
10/02   00000/00000 00000/00000 00000/00000 00000/00000
10/03   00000/00000 00000/00000 00000/00000 00000/00000
10/04   00000/00000 00000/00000 00000/00000 00000/00000
10/05   00000/00000 00000/00000 00000/00000 00000/00000
10/06   00000/00000 00000/00000 00000/86398 00000/00000
current 00000/00000 00000/00000 00000/70200 00000/00000









                                    (E)xit
```

14-18. Option F - View Performance History Menu.

Alarm History Menu

Select **G** from the Maintenance Terminal Main Menu and the View Alarm History menu appears. This screen contains the time and date stamp of the first and last occurrence of each alarm. The maximum nonoverflowing count on this screen is 999.

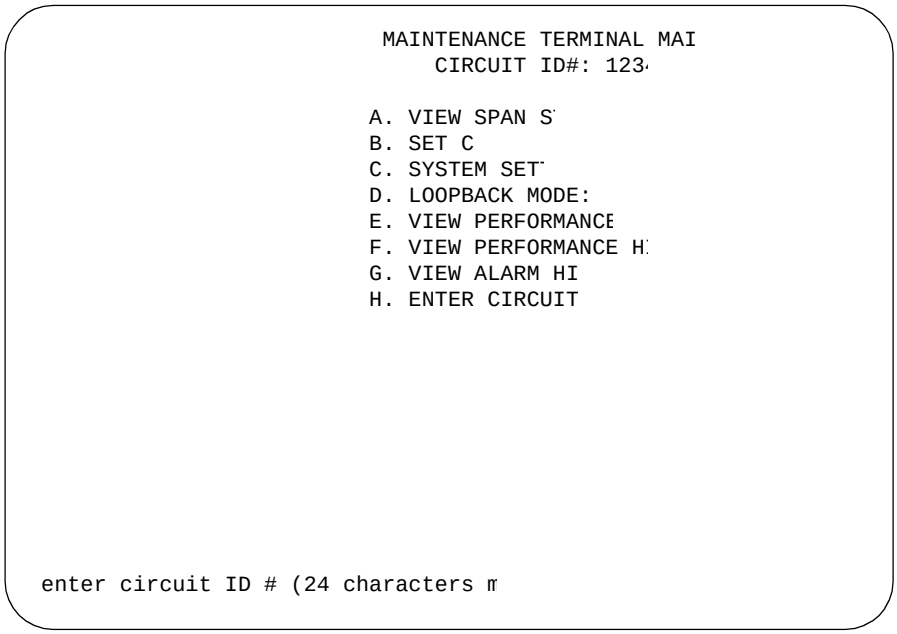
Press **C** to clear the counts.

```
                              ALARM HIST

TIME: 01:09:3
DATE: 07/13/9
CIRCUIT ID#

Type              First              Last          Current        (
LOS, DS1-HLU                                       OK
LOS, DS1-HRU                                       OK
LOSW, HDSL        07/13/97-01:11     07/13/97-01:11    ALARM
ES, HDSL                                           OK
MARGIN LP                                          OK

LAST CLEARED:  07/13/97-01:



                         (E)xit (C)lear (U)pd
```

14-19. Option G - View Alarm History Menu.

Circuit ID# screen

Select **H** from the Maintenance Terminal Main Menu to assign a Circuit ID#. A Circuit ID# is an identifier of up to 24 alphanumeric characters. This entry is stored in NVRAM and remains even after a loss of power. The circuit id # is not available at the remote location of the maintenance port.



14-20. Option H - Enter Circuit ID #.

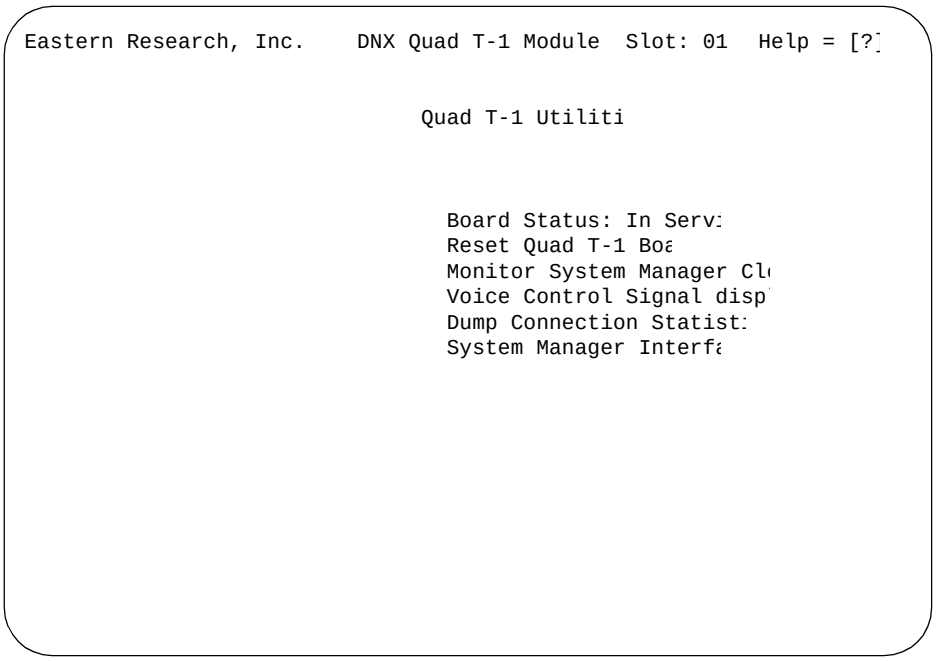
QUAD T-1 MODULE UTILITIES

NOTE: The fields shown in this menu are the default settings and should not be accessed or configured unless you are established as a high level user (e.g., Developer); they are for debugging purposes only. It is strongly suggested that you do not tamper with these fields unless prompted to do so by an Eastern Research Technical Support Representative.

Procedure

To access the Quad T-1 Utilities, follow these steps:

1. From the DNX Main Menu, select Node Summary.
2. Select a Slot that has been configured for Quad T-1.
3. From the Quad T-1 menu, select Utilities. Place your cursor on the Utilities field and press **<Enter>**. The following screen appears.


Eastern Research, Inc. DNX Quad T-1 Module Slot: 01 Help = [?]
Quad T-1 Utiliti
Board Status: In Serv
Reset Quad T-1 Boa
Monitor System Manager Cl
Voice Control Signal disp
Dump Connection Statist
System Manager Interfa

14-21. Quad T-1 Utilities Menu.

QUAD T-1 UTILITIES MENU FIELD DESCRIPTIONS

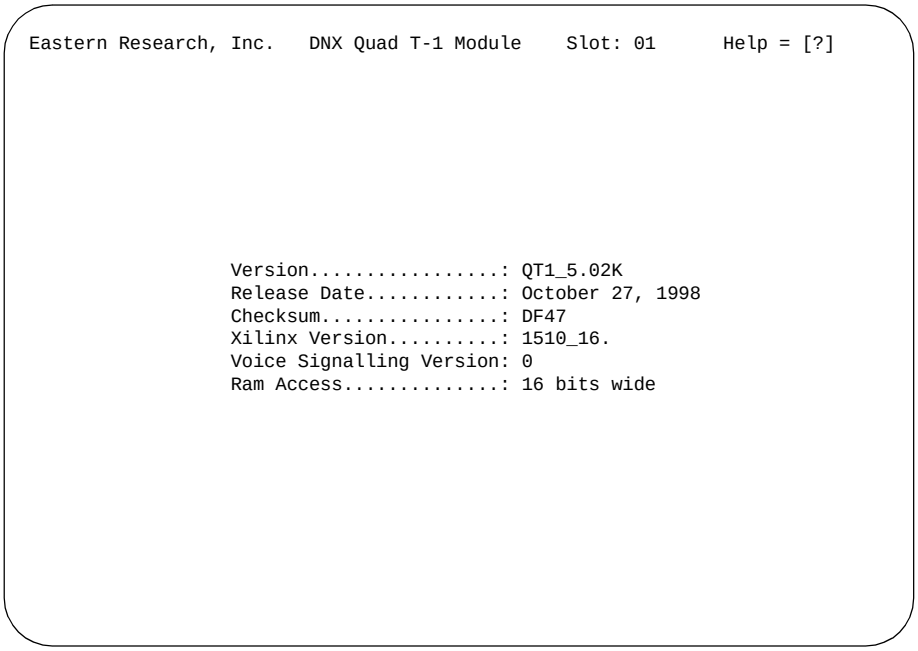
- **Board Status** - shows whether the board is in service or out of service.
- **Reset Quad T1 Board** - resets or re-initializes the Quad T1 board.
- **Monitor System Manager Clock** - gives the status of vital system timing.
- **Voice Control Signal Display** - A diagnostic used to determine the status of voice signaling.
- **Dump Connection Statistics** - A diagnostic tool used to determine the status of the connection.
- **System Manager Interface** - provides system manager statistics, such as map checksum and byte count.

QUAD T-1 WITH XDSL MODULE ABOUT MENU

Procedure

To display identification information for the Quad T-1 with xDSL module:

1. From the DNX Main Menu, select Node Summary.
2. Select a Slot that has been configured for Quad T-1.
3. From the Quad T-1 menu, select About. Place your cursor on the About field and press **<Enter>**. The following screen appears.


Eastern Research, Inc. DNX Quad T-1 Module Slot: 01 Help = [?]
Version.....: QT1_5.02K
Release Date.....: October 27, 1998
Checksum.....: DF47
Xilinx Version.....: 1510_16.
Voice Signalling Version: 0
Ram Access.....: 16 bits wide

14-22. Quad T-1 About Menu.

About Menu Field Descriptions

Version: This is the software version current in the T-1's flash memory.

Release Date: The engineering release to production.

Checksum: The sum of all bytes in the T-1's flash memory at power up.

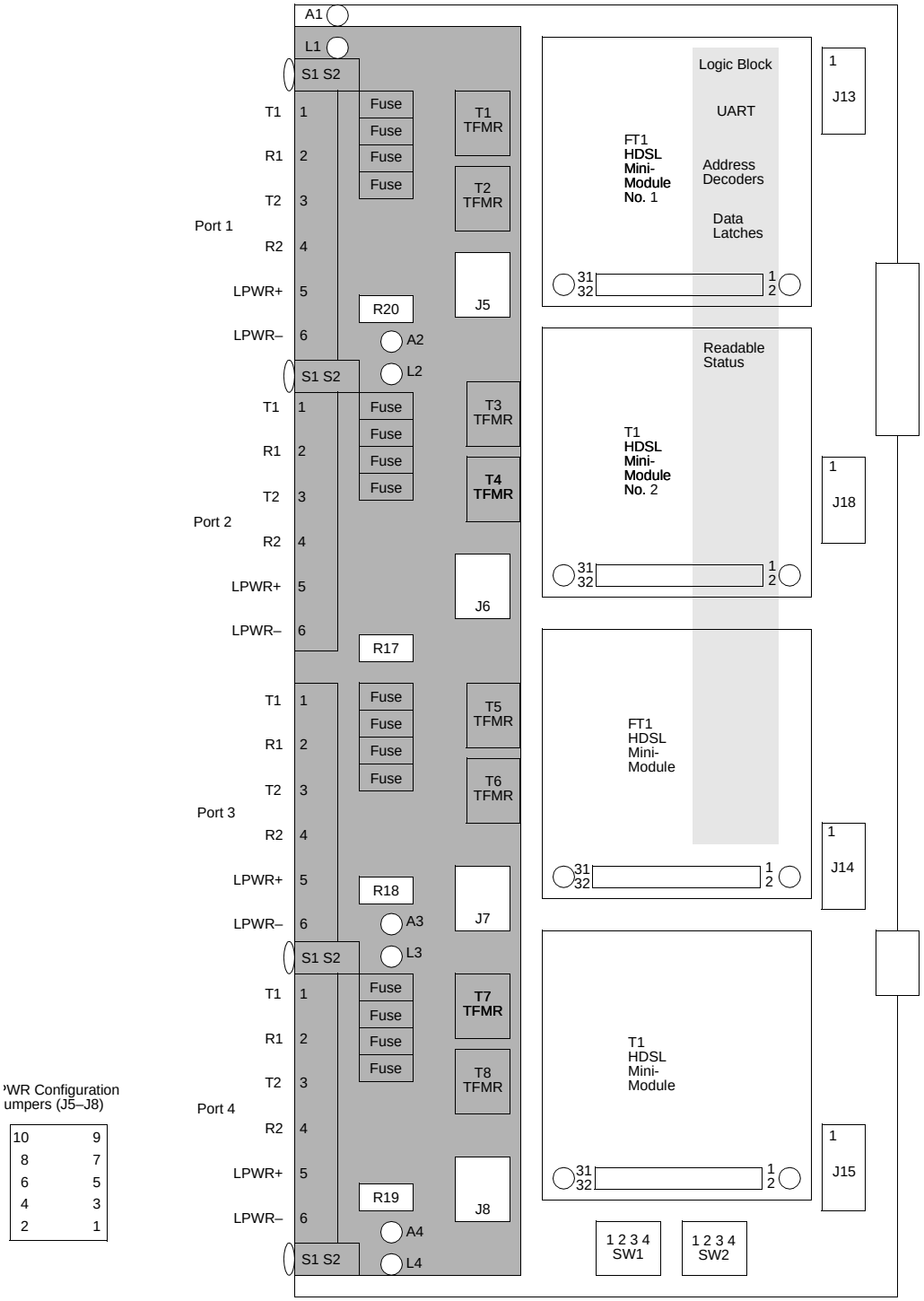
XILINX Version: The hardware version of downloadable, programmable devices.

Voice Signalling Version: The revision level of software used in the commands bits for voice signaling.

Ram Access: The size of the memory buss.

Table 1: Quad T-1 with xDSL Module Specifications.

Loop Technology	Modulation type: 2B1Q Mode: Full duplex, echo cancellation Number of Pairs: 2 for T-1/E-1; 1 for FT-1
HDSL Bit Rate	T-1: 784 kbps/pair E-1: 1040 kbps/pair FT-1: 784 kbps (1 pair)
Status Indicators	Loop 1 & 2 synchronization HDSL alarm Loopback Data Interface: T-1/FT-1 (1.544 Mbps); E-1 (2.048 Mbps) Host Processor Communications Interface: Asynchronous 2-wire serial Input/Output Levels: CMOS levels
Environment	Operating temp: -40^0 C to $+85^0$ C (-140^0 F to $+185^0$ F)
Physical Dimensions	2.5” W x 2.0” L x 0.38” H 6.35 cm W x 5.08 cm L x 0.95 cm H 32-pin connector to host board
ERI Part #	CON-049-78027 (Plug, Cable, 6-pos.)



14-19. HDSL Module.

Quad T-1 with xDSL Module 14-31

HDSL Interface

Table 2: Pin Assignments

Pin 1	Data path to the HDSL Mini-Module
Pin 2	CPU Data from On-Board UART that is going to HDSL
Pin 3	+5V
Pin 4	Data from HDSL Mini Module to UART
Pin 5	Ground
Pin 6	Not Used
Pin 7	Not Used

Locally-Powered HDSL Configuration

If the remote is locally-powered, configure the port as shown below:

- Port 1 = J5
- Port 2 = J6
- Port 3 = J7
- Port 4 = J8

Table 3: Locally-Powered HDSL Configuration

Mini Module	1 & 2 (bottom position)	3 & 4	5 & 6	7 & 8	Not Used (top position)
T1				X	
FT1				X	

Since the local end is powered by the network's HDSL base card, make sure you remove all jumpers if the remote master is powering the line. Otherwise, install jumper 7 & 8.

Line Grounding

For on board lightning protection using the on-board solid state surge suppressors, be sure to attach bezel screws and insure the Zero Ohm resistors are intact on the main printed circuit board, at the following indicated locations as shown in Table 4:

Table 4: Line Grounding

Port #	Short 1 & 2
1	R20
2	R17
3	R18
4	R19

PCB Rev. 0 Resistor Jumper

The following table should be used if the hardware undergoes a major change.

Table 5: PCB Rev. 0 Ohm Resistor Jumper

PCB Rev	R33	R32	R31
0 (released rev)			
1			X
2		X	
etc.			

Indicators

Table 6: Indicators

DS1	Module 1 Alarm
DS2	Module 1 Loop
DS3 (rear bezel left side)	Module 1 Sync 1
DS3 (rear bezel right side)	Module 1 Sync 2
DS8	Module 2 Alarm
DS7	Module 2 Loop
DS4 (rear bezel left side)	Module 2 Sync 1
DS4 (rear bezel right side)	Module 2 Sync 2
DS10	Module 3 Alarm
DS9	Module 3 Loop
DS5 (rear bezel left side)	Module 3 Sync 1
DS5 (rear bezel right side)	Module 3 Sync 2
DS12	Module 4 Alarm
DS11	Module 4 Loop
DS6 (rear bezel left side)	Module 4 Sync 1
DS6 (rear bezel right side)	Module 4 Sync 2

Dip Switch Settings

Table 7: Dip Switch Settings

SW1-1	**SW1-2**	**Module 1 type at J9 for Port 1**
ON	ON	**Module not installed**
ON	OFF	**FT1**
OFF	ON	**T1**
OFF	OFF	**Undefined**
SW1-3	**SW1-4**	**Module 2 type at J10 for Port 2**
ON	ON	**Module not installed**
ON	OFF	**FT1**
OFF	ON	**T1**
OFF	OFF	**Undefined**
SW2-1	**SW2-2**	**Module 3 type at J11 for Port 3**
ON	ON	**Module not installed**
ON	OFF	**FT1**
OFF	ON	**T1**
OFF	OFF	**Undefined**
SW2-3	**SW2-4**	**Module 4 type at J12 for Port 4**
ON	ON	**Module not installed**
ON	OFF	**FT1**
OFF	ON	**T1**
OFF	OFF	**Undefined**

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15 Test Access

Before You Begin

In order to display the Test Access Module (TAM) menus, you must have the following cards installed in the equipment nest:

- the TAM card must be installed in a front slot and the slot must be configured for module type: TAM
- a Quad High Speed card must be installed in a rear slot and the slot must be configured for module type: Quad High Speed
- the *Configured Type* and *Actual Type* noted on the Node Summary Menu must match

```
Eastern Research, Inc.       DNX 4 - System Manager        Help = [?]
Standby SMC not present

                              Node Summary Menu

Slot#  Configured Type   Actual Type       Status
-----  ---------------   -----------       ------
01)    Quad T1           Quad T1           Alarm
02)    Test Access       Test Access       OK
03)    Quad OCU          Quad OCU          OK
04)    Octal Voice       Octal Voice       OK









SMCA)  System Manager                      Not Present
SMCB)  System Manager                      On Line


[C]hange slot configuration      [D]elete slot configuration
```

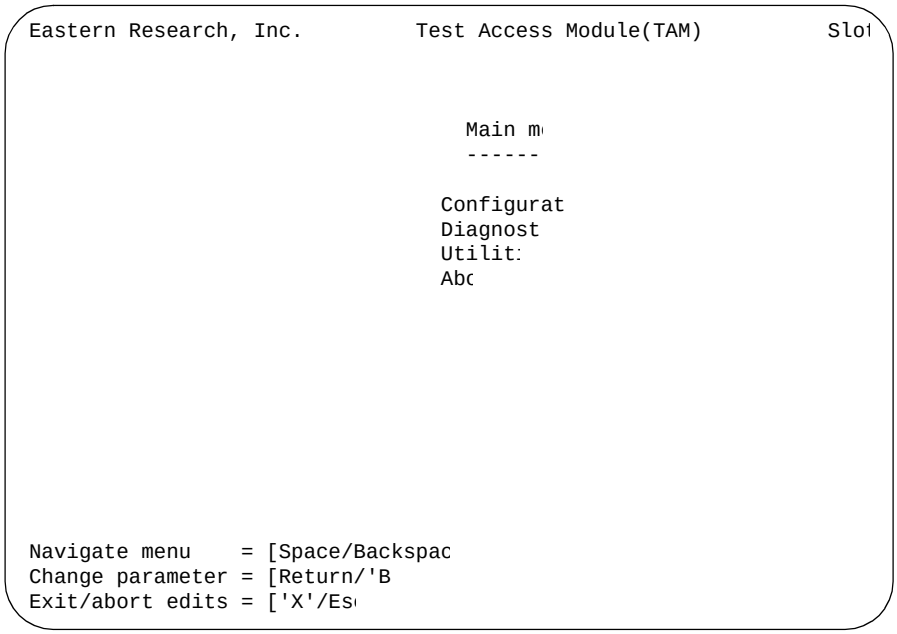
15-1. Node Summary Menu.

NOTE:

- **If the slot does not show a "configured type," refer to "Configuring a Slot" in Chapter 3 of this manual.**
- **This chapter is written from the perspective of the *ADMINISTRATOR* who employs the User Profile Manager Menu to add, change, or delete user information. Refer to Chapter 3 for an explanation of security levels.**
- **To access the User Profile Manager Menu, from the DNX Main Menu, select System Configuration, then select Users Menu. The Users Profile Manager Menu displays.**
- **To configure the Users Profile Manager for security purposes, navigate to the Users Menu.**

TAM MAIN MENU

The TAM Menu provides options that enable you to configure the TAM, perform diagnostics, access utilities, and display version and release information for the TAM Main Menu.



15-2. TAM Main Menu.

CONFIGURING TAM PARAMETERS

Procedure

To configure TAM parameters:

1. From the Main Menu, select Node Summary.
2. Select a Slot that has been configured for TAM.
3. From the TAM Main Menu, select Configuration. Place your cursor on the Configuration field and press **<Enter>**. The following screen appears.

```
Eastern Research, Inc.     Test Access               Slot:01

                               Configuration menu

           Port 1            Port 2            Port 3            Port 4

Name.....: Beta              port name         port name         port
name
Speed....: 0                 0                 56000             56000
Timing...: Internal          Internal          Internal          Internal
DCD out..: Forced On         Forced On         Forced On         Forced
On
DSR out..: Forced On         Forced On         Forced On         Forced
On
Data.....: Normal            Normal            Normal            Normal
Clock....: Normal            Normal            Normal            Normal
Interface: RS232             RS232             V.35              V.35
V.54 loop: Enabled           Disabled          Enabled           Enabled




Navigate menu    = [Space/Backspace]
Change parameter = [Return/'B']
Exit/abort edits = ['X'/Esc]
```

15-3. TAM Configuration Menu.

4. Configure all parameters for each port. For details on the parameters, refer to the following page.
5. To save changes, type **X**.
6. When prompted: “Update Configuration? Are you sure (Y/N)?” Type **Y**.

CONFIGURING TAM PARAMETERS FIELD DESCRIPTIONS

Name: (text field) This is a user-defined field. Any name up to 14 characters in length can be entered to identify each port on the Test Access Module.

Speed: (option field) The Test Access Module operates at speeds from 48 Kbps to 2.048 Mbps, and any multiple of 56/64 Kbps.

NOTE: Latching loopback sequences can be performed only at 56/64 Kbps.

Timing: The tester interface timing is set to Internal and can not be changed. Test equipment attached to the TAM I/O port must accept clocks from the TAM.

DCD Out: (option field) The TAM card presents a DCE interface to the attached test equipment. Carrier detect can be forced off, forced on, track RTS but this is not relevant for test equipment.

DSR Out: (option field) Data Set Ready can be forced off, forced on, or track DTR but this is not relevant for test equipment.

Data: (option field) The options are normal or inverted.

Clock: (option field) Initially choose “Normal.” If frequent errors occur at the port, try “Inverted” and check performance.

Normally, the down-going clock edge is in the middle of each bit. On lengthy cables when a clock is sent from one device to clock data from the other device, the data arrives skewed from the originating clock due to the round trip cable delay. When the delay is such that the originating clock down-going edge is on the edge of the bit returned, “Inv” will correct this condition inside the module.

Interface: (option field) The interface options are V.35, RS530/422 and RS232.

V.54 Loop: The TAM card does not respond to the V.54 loop.

TAM DIAGNOSTICS

Procedure

To view Diagnostics on the TAM:

1. From the Main Menu, select Node Summary.
2. Select a Slot that has been configured for TAM.
3. From the TAM Main Menu, select Diagnostics. Place your cursor on the Diagnostics field and press **<Enter>**. The following screen appears.

```
Eastern Research, Inc.          Test Access Module(TAM)          Slot: 01

                                 Diagnostic menu
Name:             port name       port name       port name     port name

Local Loop.....: Off              Off             Off           Off
Remote Loop....: Off              Off             Off           Off

BERT...........: Off              Off             Off           Off
Seconds in test: 0                0               0             0
Local err-secs.: 0                0               0             0
Remote err-secs: 0                0               0             0

RTS/DCD........: Off/On           Off/On          Off/On        Off/On
DTR/DSR........: Off/On           Off/On          Off/On        Off/On









Navigate menu    = [Space/Backspace]    [C]lear counts   Insert [E]rrors
Change parameter = [Return/'B']
Exit/abort edits = ['X'/Esc]
```

15-4. Diagnostics Menu.

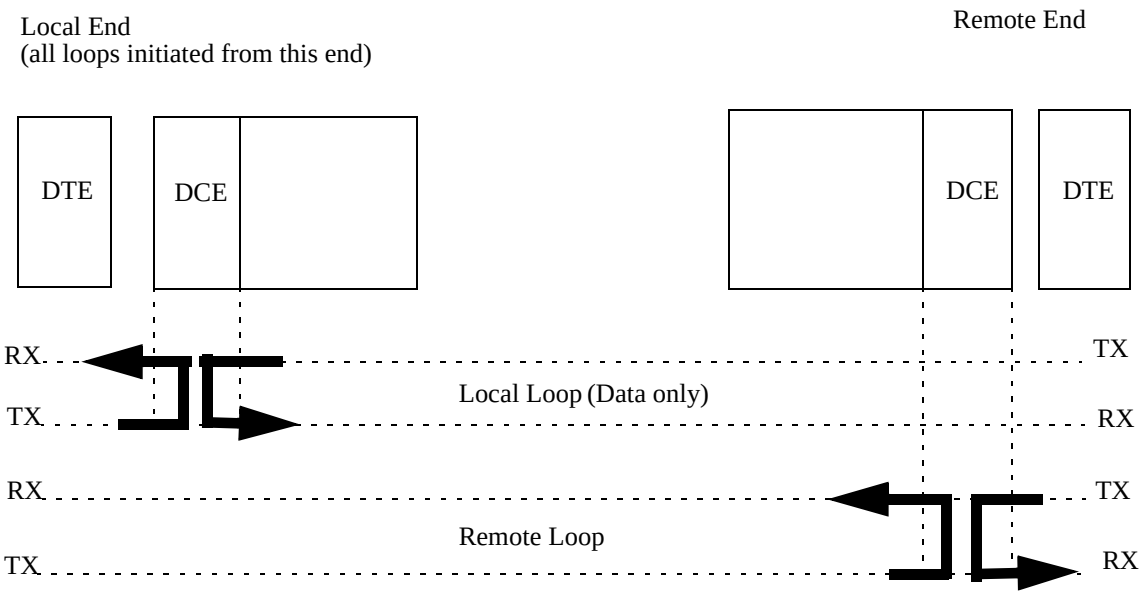
CONTROLS

Local Loop: When set to ON, this parameter causes a bi- directional local loop at the Test Access Module where the command was entered. If you turn the local loop "ON," the front panel yellow "LOOP" LED will illuminate and local testing can be performed by external test equipment or by DNX's internal BERT. Only data is looped. Clocks and control signals are not looped.

Remote Loop: Remote Loop causes a remote line loop at the distant end of a point-to-point circuit. There are several options you can choose from when you select remote loop. They are as follows:

- ***Off*** - unloops the previously looped device
- ***Latching loop off*** - unloops any device in latching loopback
- ***V.54 loop off*** - unloops any device in V.54 Loopback
- ***V.54 - places*** *V.54* responsive device in loopback
- ***Latching CSU*** - punches through repeaters if present and places the CSU in latching loopback
- ***Latching OCU*** - places the OCU in latching loopback
- ***Latching DSU*** - places the DSU in latching loopback
- ***Latching Smartjack NEI*** - places smartjack in latching loopback
- ***Latching Repeater #1*** - latches the first repeater or Smartjack on the loop
- ***Latching Repeater #2*** - latches the second repeater or Smartjack after punching through the first
- ***Latching DS0 Dataport Drop side*** - places the DSO dataport drop side in latching loopback
- ***Latching DS0 Dataport Line side*** - places the DSO dataport line side in latching loopback
- ***Latching Loop side interface*** - places the latching loopback interface in latching loopback
- ***Execute Punch through sequence*** - punches through looped repeaters without checking returned codes
- ***Identical Dataports*** - number of dataports preceeding the dataport to be placed in latching loopback
- ***Verbose Display*** - detailed latching confirmation information
- ***Check Return Codes*** - confirms latching loopback by verifying returned codes

TAM DIAGNOSTICS



Controls (cont.)

BERT: This is useful for testing for errors on the communication circuit. The device checks for errors by comparing a received data pattern with a known transmitted data pattern to determine line quality.

Seconds in Test: This read-only count represents the number of seconds the data module was in test.

Local Error Seconds: This read-only count represents the number of local errored seconds that occurred in a one second period while the data module was in test.

Remote Error Seconds: This read-only count represents the number of remote errored seconds that occurred in a one second period while the data module was in test.

Clear Count: The “C” command will zero all local and remote errored seconds.

Insert Errors: The “E” will generate 1 or 2 errored seconds for either 2047, ones, or zeros BERT pattern.

INDICATORS

DCD: If this indicator is ON, your Test Access Module is sending a “Data Carrier Detect” signal over its serial port interface.

DTR: If this indicator is ON, your Test Access Module is sending a “Data Terminal Ready” signal over its serial port interface.

DSR: If this indicator is ON, your Test Access Module is sending a “Data Set Ready” signal over its serial port interface.

TAM UTILITIES

WARNING: **The following menus are for debugging purposes only. It is strongly advised that you do not tamper with these menus unless prompted to do so by an Eastern Research Technical Support Representative.**

Overview

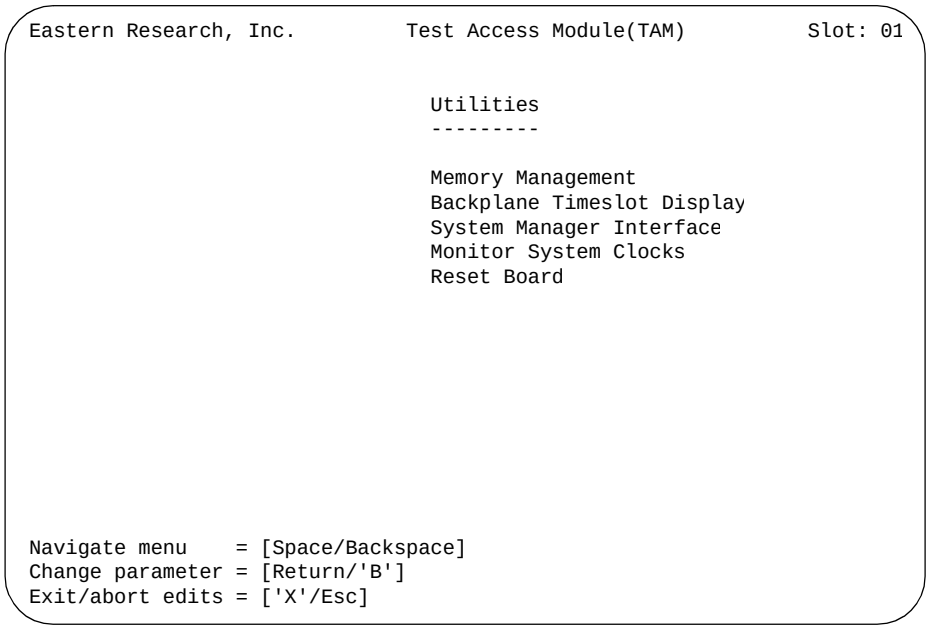
DNX provides access to these TAM utilities:

- **Memory Management** - view or change memory on the card.
- **Backplane Time Slot Display** - write to or read from the backplane time slots display.
- **System Manager Interface** - provides system manager statistics, such as map checksum and byte count.
- **Monitor System Clocks** - gives the status of vital system timing.
- **Reset Boards** - resets the TAM card.

Procedure

To access the TAM utilities:

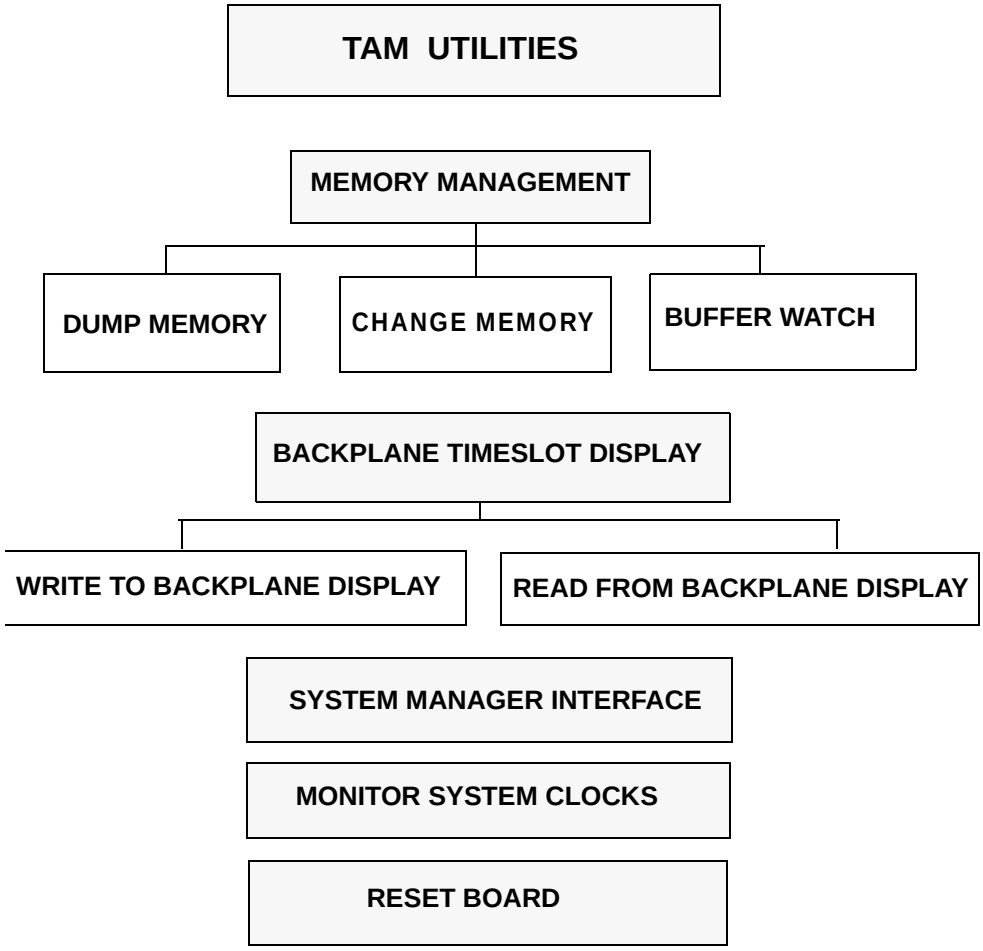
1. From the Main Menu, select Node Summary.
2. Select a Slot that has been configured for TAM.
3. From the TAM Main Menu, select Utilities. Place your cursor on the Utilities field and press **<Enter>**. The following screen appears.



15-5. TAM Utilities Menu.

TAM UTILITIES SUBMENUS

The following diagram illustrates the menu structure for the TAM Utilities menu. From the illustration, you can see what types of actions are available from the TAM Utilities menu.



15-6. TAM Utilities Menu Structure.

ABOUT MENU

Procedure

To display identification information for the TAM:

1. From the Main Menu, select Node Summary.
2. Select a Slot that has been configured for TAM.
3. From the TAM Main Menu, select About. Place your cursor on the About field and press **<Enter>**. The following screen appears.

```
Eastern Research, Inc.         Test Access Module(TAM)          Slot: 03

Eastern Research Inc.
225 Executive Drive
Moorestown, NJ 08057
Tel - 800.337.4374
FAX - 609.273.1847
                        TAM - Test Access Module
                        ------------------------

                            Version.........: TAM 0200d
                            Release Date.....: Sept. 28, 1998
                            Checksum.........: 634E
                            Xilinx Version...: tam2658.









Navigate menu    = [Space/Backspace]
Change parameter = [Return/'B']
Exit/abort edits = ['X'/Esc]
```

15-7. Sample About Menu.

About Field Descriptions

Version: This is the software version current in the TAM's flash memory.

Release Date: The engineering release to production.

Checksum: The sum of all bytes in the TAM's flash memory at power up.

XILINX Version: The hardware version of downloadable, programmable devices.

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16 Octal T1/E1

Before You Begin

In order to view the menus associated with the Octal T1/E1 module, the following must be performed:

- the Octal T1/E1 card must be in a slot in the equipment nest
- the slot must be configured for module type: Octal T1/E1
- the *Configured Type* and *Actual Type* noted on the Node Summary Menu must be Octal T1/E1

```
Eastern Research, Inc.       DNX 4 - System Manager        Help = [?]
Standby SMC not present

                                Node Summary Menu

Slot#  Configured Type   Actual Type       Status
-----  ---------------   -----------       ------
01)    Quad T1           Quad T1           Alarm *
02)    Octal T1/E1       Octal T1/E1       Alarm  Test *
03)    Quad OCU          Quad OCU          OK
04)    Octal Voice       Octal Voice       OK









SMCA)  System Manager                      Not Present
SMCB)  System Manager                      On Line


[C]hange slot configuration      [D]elete slot configuration
```

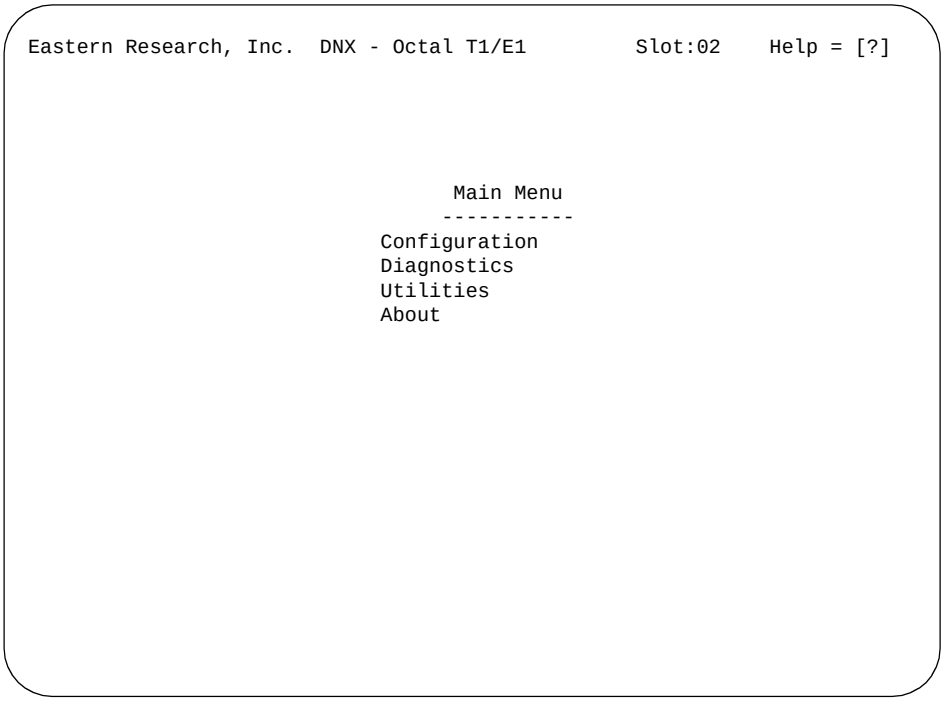
16-1. Node Summary Menu.

NOTE:

- **If the slot does not show a "Configured Type," refer to "Configuring a Slot" in Chapter 3 of this manual.**
- **This chapter is written from the perspective of the *ADMINISTRATOR* who employs the User Profile Manager Menu to add, change, or delete user information. Refer to Chapter 3 for an explanation of security levels.**
- **To access the User Profile Manager Menu, from the DNX Main Menu, select System Configuration, then select Users Menu. The Users Profile Manager Menu displays.**
- **To configure the Users Profile Manager for security purposes, navigate to the Users Menu.**

OCTAL T1/E1 MAIN MENU

The Octal T1/E1 Main Menu provides options that enable you to configure the Octal T1/E1 module, run diagnostics, access utilities, and display module identification.



16-2. Octal T1/E1 Main Menu.

CONFIGURING THE OCTAL T1/E1 MODULE PARAMETERS

NOTE: The Octal T1/E1 configuration files are stored on the System Manager Card. When an Octal T1/E1 card is replaced, the old configuration is preserved.

Procedure

To configure the Octal T1/E1 module's parameters:

1. From the Main Menu, select Node Summary.
2. Select a slot that has been configured for Octal T1/E1.
3. From the Octal T1/E1 Main Menu, select Configuration. Place your cursor on the Configuration field and press **<Enter>**. The Links Configuration Menu appears.

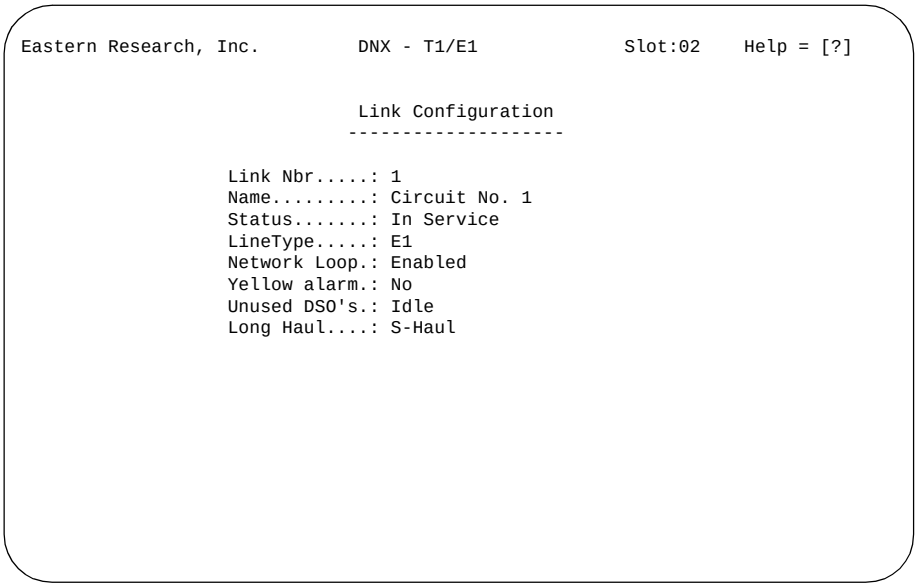
```
Eastern Research, Inc.   DNX - Octal T1/E1      Slot:02    Help = [?]


                             Links Configuration
                            ---------------------
                                                              Network  Yel    Idle
   Link Name         Framing       FDL   LH/LBO   Loop      Alarm  Code
-- ------------------------------ ------ -------  -------  -----  ----
01 08                E1                   S-Haul   Enable   No     Idle
02 Circuit Number    Out Of Service
03 windsor           E1-CRC               S-Haul   Enable   No     Idle
04 Circuit Number    Out Of Service
05 Circuit Number    Out Of Service
06 Circuit Number    Out Of Service
07 Circuit Number    Out Of Service
08 Circuit Number    Out Of Service


LH - long haul[E1]   LBO - line build out[T1]   FDL - facility data link
```

16-3. Links Configuration Menu.

4. To configure all parameters for each link, place your cursor on a link number field and press **<Enter>**. The following submenu appears.



16-4. Link Configuration submenu.

The field entries on this screen are described on the next page.

Procedure (cont.)

5. To save changes, type **X.**
6. When prompted: “Update Configuration? Are you sure (Y/N)?” Type **Y.**

LINK CONFIGURATION FIELD DESCRIPTIONS

Link Number: Displays the link number selected from the Link Configuration menu.

Name: (text field) This is a user-defined field. Any name up to 20 characters in length can be entered to identify each port on the Octal T1/E1. Some users find it beneficial to use circuit numbers to name the ports.

Status: (option field) This field determines the status of the port. The status will either be “in service” or “out of service”.

- *In Service* - an operational link that shows a valid configuration has been set up. When the port is *Active* or *In Service* you can run Diagnostics.
- *Out of Service* - a mechanism to avoid getting alarms. *Out of Service* also causes the port to be *Inactive* and you cannot run Diagnostics.

Line Type: (option field) This field determines the type of framing used on the line. The line types are as follows:

Short Haul and Long Haul line interface options are available with E1 line types (i.e., how long the line is coming from your facility).

- E1
- E1-CRC
- E1-CAS
- E1-CAS- CRC
- E1-Unframed

An LBO option field is available with T1 line types.

- T1-ESF AMI 62411
- T1-ESF B8ZS Clear
- T1 D4 B8ZS Clear
- T1 D4 AMI 62411
- T1overE1

Network Loop: (option field) This entry determines the module’s ability to respond to loop diagnostic commands received from the network supplier.

Yellow Alarm: (option field) "Yes" causes the module to discard data and send a "yellow alarm" if it is in a "red alarm" condition after a three second period. "Yes" must be chosen if the network supplier is a common carrier, such as a telephone company.

Unused DS0s: (option field) This selection determines whether the data that will be transmitted over the unused DS0s will be "IDLE" or "BUSY."

ESF Format: (option field) This entry describes the types of ESF network commands that the T1 module will respond to. It has no meaning for D4 networks. With ESF networks, this information must be obtained from the network supplier. Choose between AT&T Technical Reference 54016 and ANSI specification T1.403.

Short Haul: Physical interface selection for co-located E1 equipment.

Long Haul: Physical interface selection for long connection to E1 equipment.

LBO: (T1 option field) 0.0db through 22.5db = long haul; 0-133 Ft. through 655 Ft. = short haul.

- 0.0db <> Long Haul
- 7.5db <> Long Haul
- 15.0db <> Long Haul
- 22.5db <> Long Haul
- 0-133 Ft. <> Short Haul
- 133-266 Ft. <> Short Haul
- 266-399 Ft. <> Short Haul
- 399-533 Ft. <> Short Haul
- 533-655 Ft. <> Short Haul

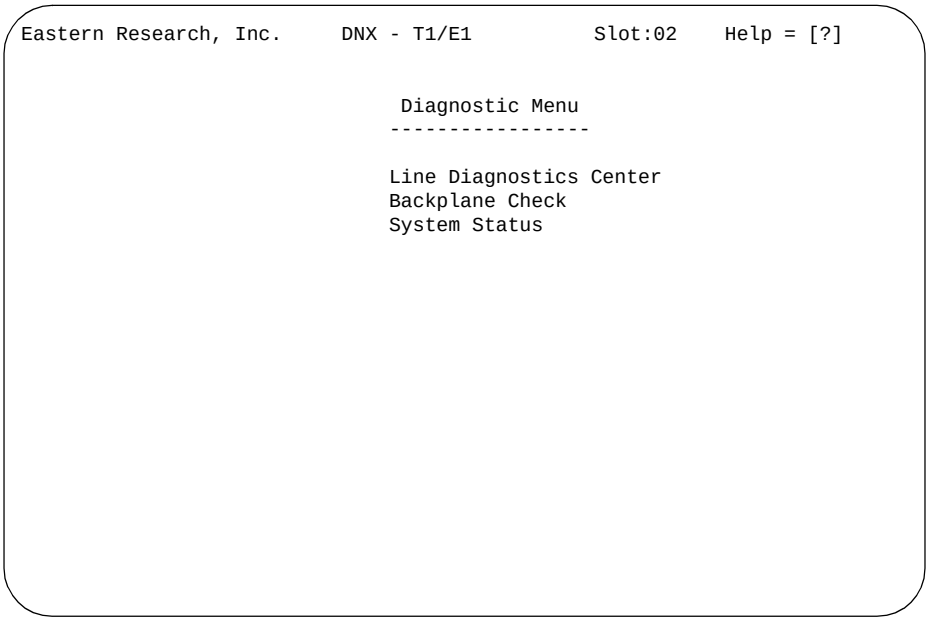
NOTE: Long haul/short haul designation for E1 is defined by authentication of signal presented to the receiving circuitry, not by cable length. Short haul is defined as 0 to -6db, long haul as 0 to -34db. This loss is related to cable type and cable length.

OCTAL T1/E1 DIAGNOSTICS

Procedure

To run Diagnostics on the Octal T1/E1 module:

1. From the Main Menu, select Node Summary.
2. Select a Slot that has been configured for Octal T1/E1.
3. From the Octal T1/E1Main Menu, select Diagnostics.
4. From the Diagnostics menu, select Line Diagnostics Center. Place your cursor on the Diagnostics field and press **<Enter>**.



16-5. Diagnostics Menu.

Upon selecting the Line Diagnostics Center, the following menu appears.

```
Eastern Research, Inc.     DNX - T1/E1         Slot:02    Help = [?]


                             Diagnostics Manager
                             -------------------
                      Errored Link    Bkpln          Test       Local
 Link Name   State    Seconds Loop    Loop  Bert     Duration   Errors
------------ -------- ------- ------- ----- -------- ---------  ------
Circuit No.  *ERROR*   501    Off     Off   Off      0          0
Circuit Num  Inactive  0      Off     Off   Off      0          0
windsor      *ERROR*   18421  Off     Off   Off      0          0
Circuit Num  Inactive  0      Off     Off   Off      0          0
Circuit Num  Inactive  0      Off     Off   Off      0          0
Circuit Num  Inactive  0      Off     Off   Off      0          0
Circuit Num  Inactive  0      Off     Off   Off      0          0
Circuit Num  OK        57     Local   Off   Off      0          0

[B]ert   [L]oop  [E]xpose  [C]lear Error Counters
ESF [S]tatistics ESF [R]egisters    [G].826

------------  Hit key 1 thru 9 to insert an error  ----------------------
-
[1]CAS Multiframe   [2]Multiframe           [3]PRBS      [4]FBit
[5]Frame Alignment  [6]Line Code Violation  [7]Bit Slip  [8]CRC  [9] All
```

16-6. Diagnostics Manager Menu.

The field entry descriptions and how to access Bert, Loop, Expose, Statistics, and Register screens are described on the following pages.

DIAGNOSTICS MANAGER FIELD DESCRIPTIONS

Link Name: The name given by the user at the Configuration screen.

State: Active (in service) - displays an ***OK*** or ****ERROR**** state; Inactive (out of service).

Errored Seconds: This is an indication of the number of seconds with errors (i.e., something went wrong on the line).

Link Loop: Reflects the status of all the loopbacks associated with the link.

Backplane Loop: Loops a data connection from the link back to the link via the backplane. Since this incorporates most of the card's hardware and software, this is a useful test to check card integrity. Note that a user connection must already be in place prior to invoking this loopback.

Bert: When ON, indicates the selected pseudo random pattern.

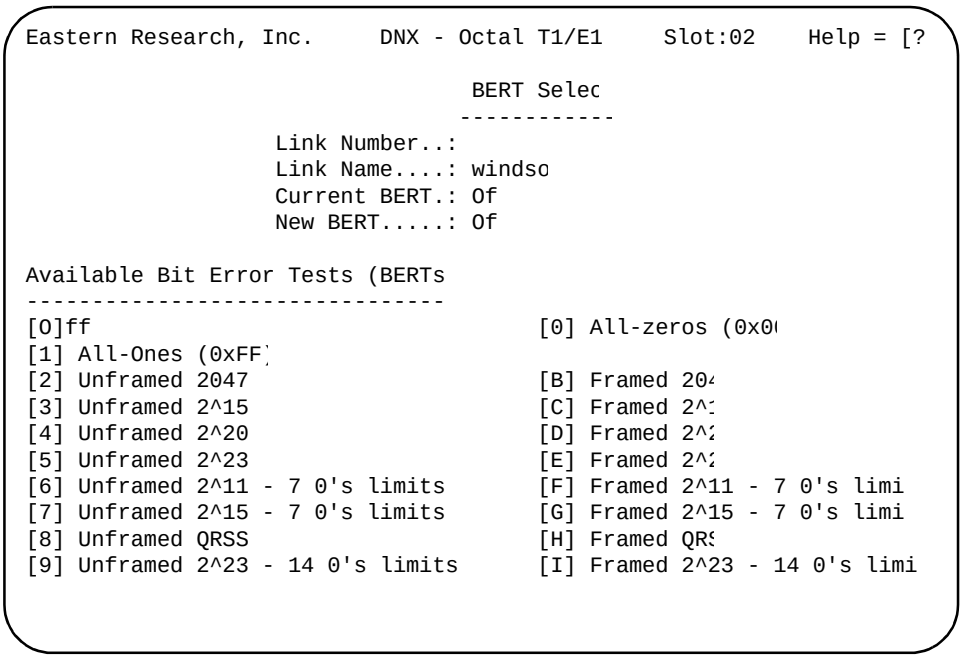
Test Duration: Once the BERT test is started, the length of the test is measured.

Local Errors: Displays the number of errors that occurred during the test.

The following hot keys invoke additional screens and/or functions. They are described on the following pages.

- **[B]**ert - pseudo random test patterns.
- **[L]**oop - allows you to set different loopbacks
- **[E]**xpose - displays the status of the line.
- **[C]**lear Error Counters - clears all errored seconds and BERT indicators
- ESF **[S]**tatistics - The ESF Statistics Menu
- ESF **[R]**egisters - The ESF Registers Menu gives the same information as the ESF Statistics Menu but it is broken down by port for each of the ninety-six 15-minute intervals in the preceding 24-hour period.
- **[G]**.826 - a status screen that displays the statistics of the performance of the link for the duration or set interval of time the link is up and running.

Keys 1 thru 9: use keys 1 through 9 to insert errors from the NI side, which is then shown on the remote side. If the remote side is line looped, the inserted errors will be seen on the local side.


Eastern Research, Inc. DNX - Octal T1/E1 Slot:02 Help = [?
BERT Selec
Link Number..:
Link Name....: windso
Current BERT.: Of
New BERT.....: Of
Available Bit Error Tests (BERTs
[O]ff
[0] All-zeros (0x0
[1] All-Ones (0xFF
[2] Unframed 2047
[B] Framed 20
[3] Unframed 2^15
[C] Framed 2^
[4] Unframed 2^20
[D] Framed 2^
[5] Unframed 2^23
[E] Framed 2^
[6] Unframed 2^11 - 7 0's limits
[F] Framed 2^11 - 7 0's limi
[7] Unframed 2^15 - 7 0's limits
[G] Framed 2^15 - 7 0's limi
[8] Unframed QRSS
[H] Framed QR
[9] Unframed 2^23 - 14 0's limits
[I] Framed 2^23 - 14 0's limi

16-7. Diagnostics BERT Select Menu.

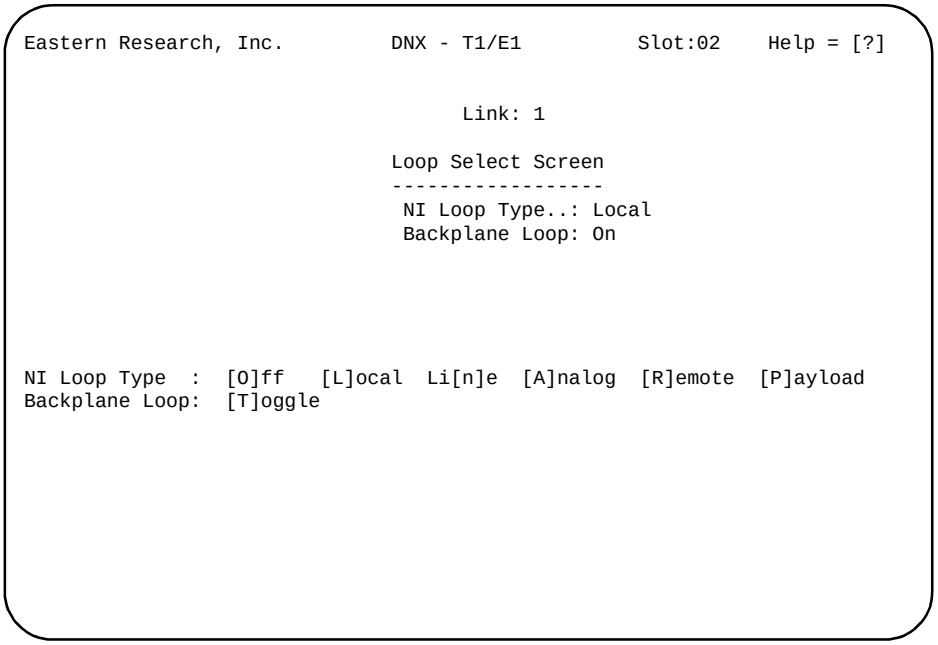
[B]ert

The BERT Select screen has a list of several test patterns.

Procedure

To access the BERT Select menu and run a test pattern:

1. Place your cursor on an *Active* link in the Diagnostics Manager Menu and type **B**. A new menu appears (see above).
2. Next, place your cursor in the *New BERT* field and press **<Enter>**. The available Bit Error Tests are displayed on the screen above.
3. Upon selecting the test pattern, type **X**. A new message appears: “Start new test? Are you sure (Y/N)?”.



16-8. Loop Select Screen.

[L]oop

The Loop Select screen has a list of several loopback options, including *Local, Line, Analog*, *Remote, and Payload.*

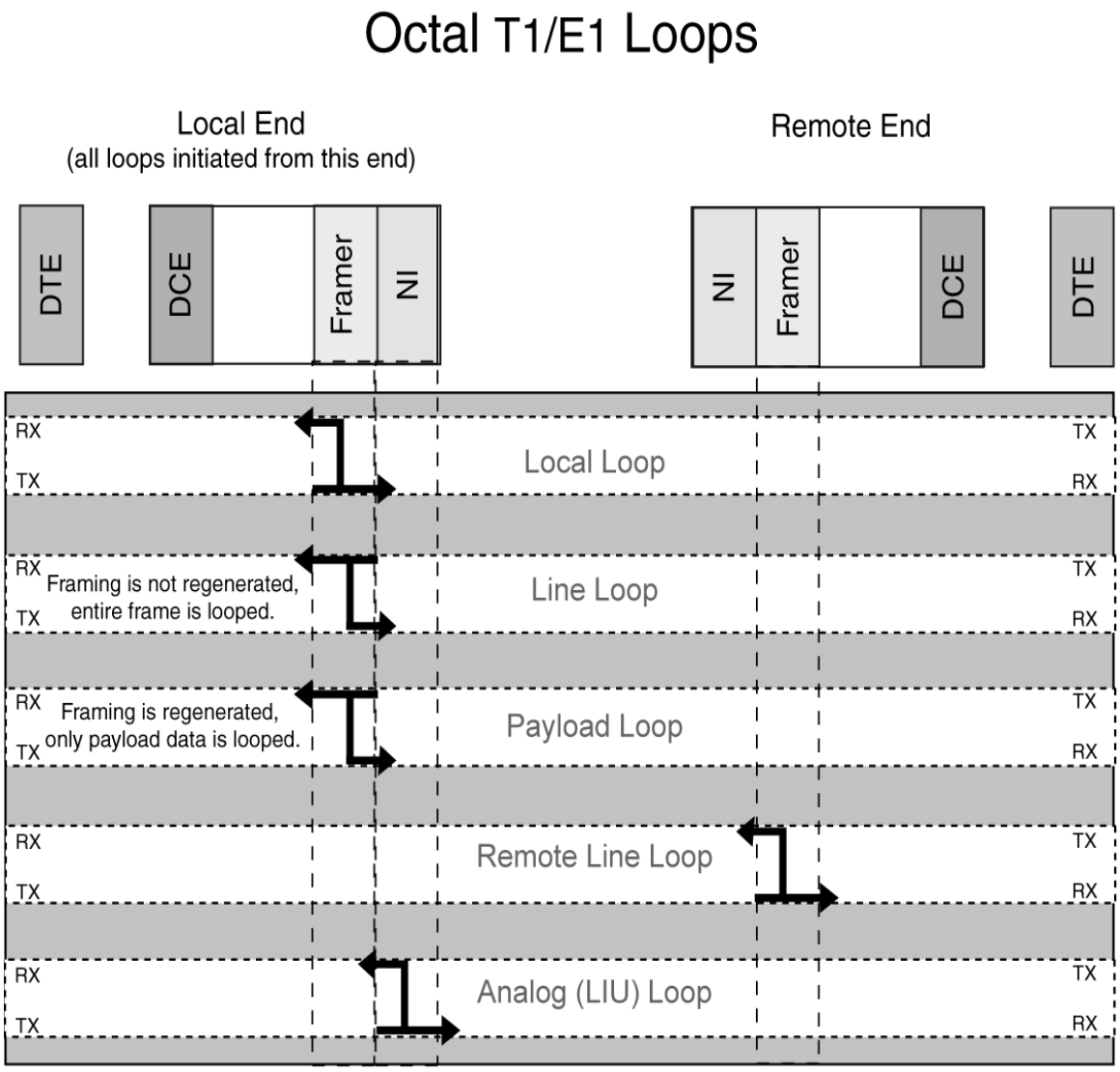
Procedure

To access the Loop Select menu and run an NI loop:

1. Place your cursor on any *Active* link in the Diagnostics Manager Menu and type **L**.
2. A new menu appears, see above. Type one of the corresponding letters below to run a specific NI loop.

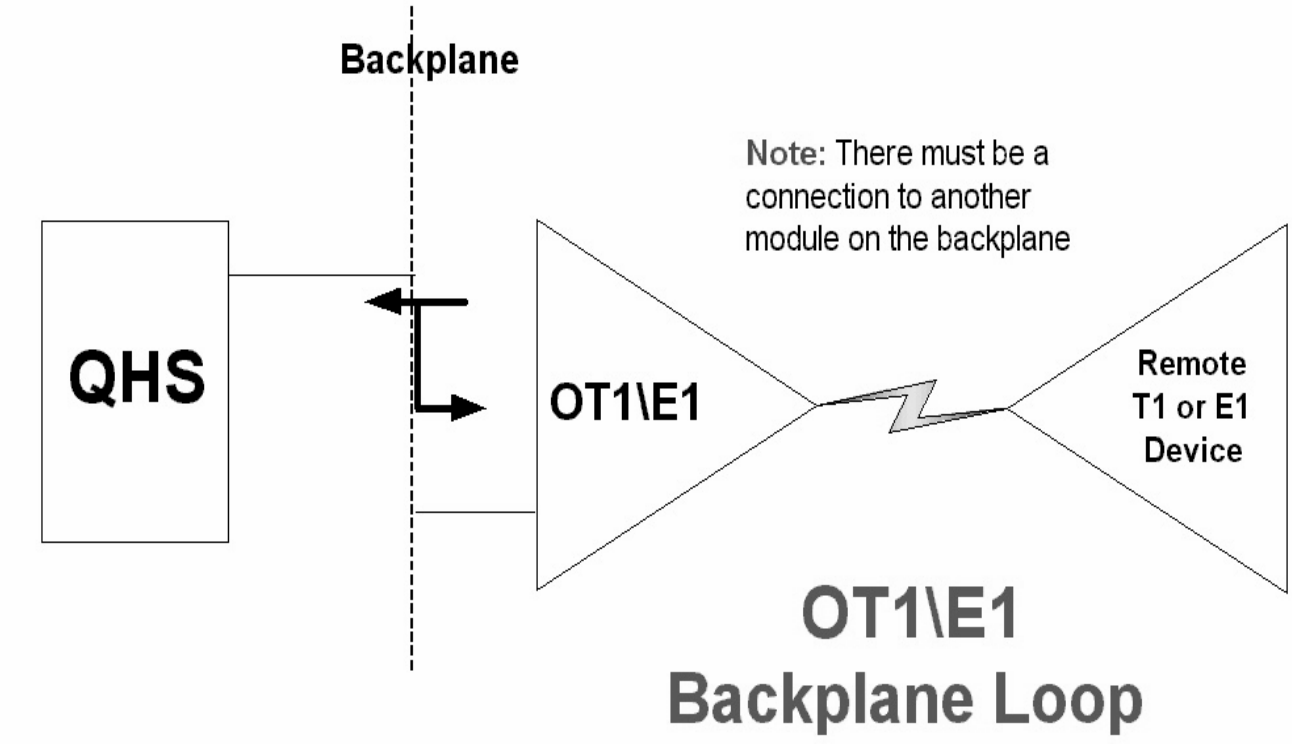
   - **[L]** - for a local loop
   - **[n]** - for a line loop
   - **[A]** - for an analog loop
   - **[R]** - for a remote loop
   - **[P]** - for a payload loop

3. Designed to check the integrity of the Backplane, toggle the *Backplane Loop* On or Off.



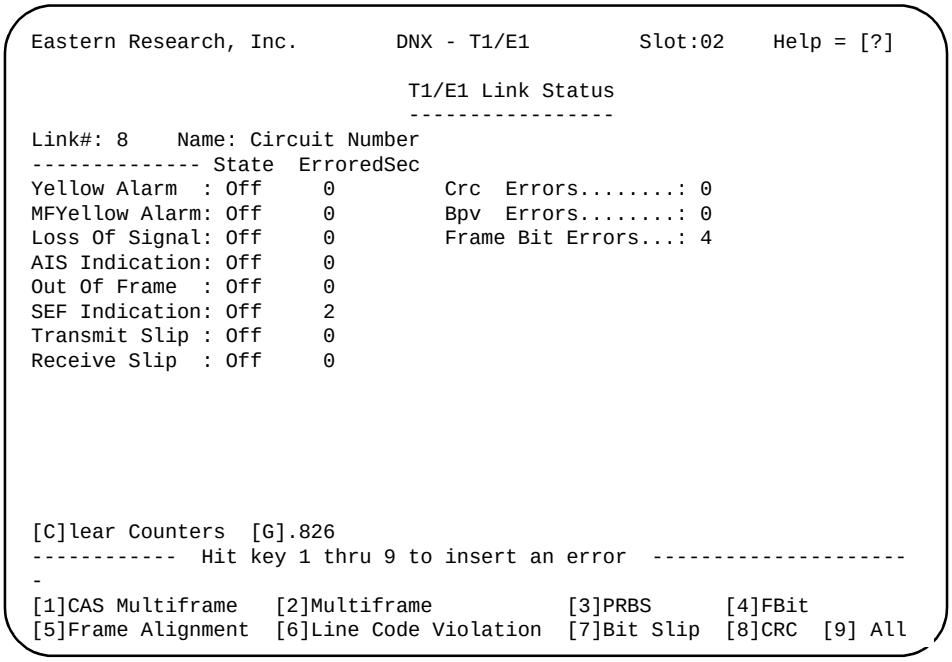
16-9. Octal T1/E1 Loops.

The Payload Loop is different than Line Loop in that it only loops the data (payload), and the framing is regenerated.



16-10. Octal T1/E1 Backplane Loop.

There must be a connection to another module or to itself mapped on the backplane.


Eastern Research, Inc. DNX - T1/E1 Slot:02 Help = [?]
T1/E1 Link Status
Link#: 8 Name: Circuit Number
State ErroredSec
Yellow Alarm : Off 0
MFYellow Alarm: Off 0
Loss Of Signal: Off 0
AIS Indication: Off 0
Out Of Frame : Off 0
SEF Indication: Off 2
Transmit Slip : Off 0
Receive Slip : Off 0
Crc Errors.....: 0
Bpv Errors.....: 0
Frame Bit Errors...: 4
[C]lear Counters [G].826
Hit key 1 thru 9 to insert an error
[1]CAS Multiframe [2]Multiframe [3]PRBS [4]FBit
[5]Frame Alignment [6]Line Code Violation [7]Bit Slip [8]CRC [9] All

16-11. Expose - T1/E1 Link Status screen.

[E]xpose

The Expose screen displays the real-time or current status of the T1/E1 link.

Procedure

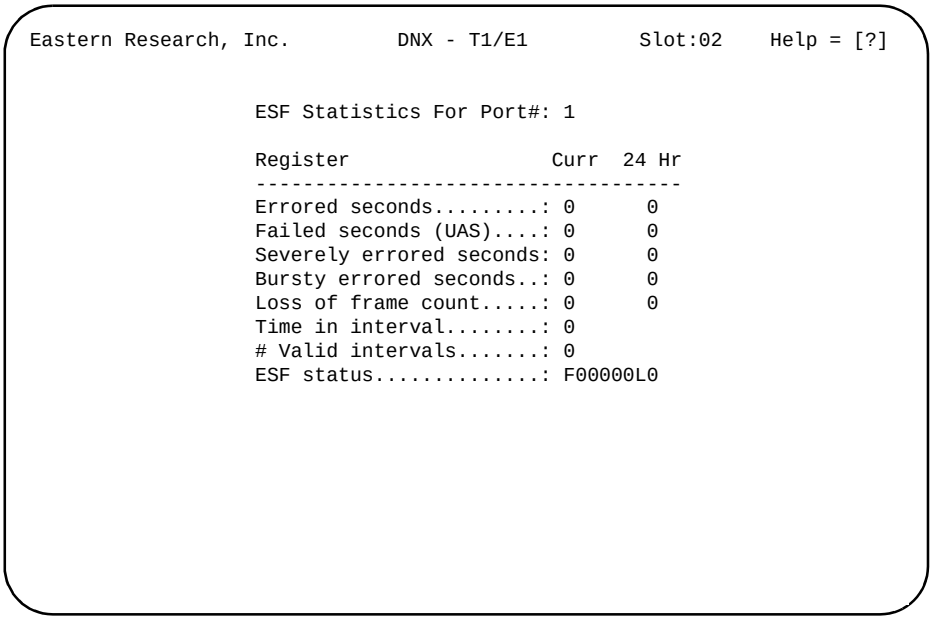
To access the Expose screen and view the status of the T1/E1 link:

1. Place your cursor on any *Active* link in the Diagnostics Manager Menu and type **E**. A new menu appears (see above).

Some of the fields are context sensitive, (e.g., the CRC errors only appear for links that support CRC such as T1 ESF, E1-CRC, or E1-CRC-CAS).

An error free link will display zeroes in all fields.

Keys 1 thru 9: use keys 1 through 9 to insert errors from the NI side, which is then shown on the remote side. If the remote side is line looped, the inserted errors will be seen on the local side.


Eastern Research, Inc. DNX - T1/E1 Slot:02 Help = [?]
ESF Statistics For Port#: 1
Register Curr 24 Hr
Errored seconds.....: 0 0
Failed seconds (UAS)....: 0 0
Severely errored seconds: 0 0
Bursty errored seconds..: 0 0
Loss of frame count.....: 0 0
Time in interval.....: 0
Valid intervals.....: 0
ESF status.....: F00000L0

16-12. ESF Statistics screen.

ESF [S]tatistics

The ESF Statistics Menu enables you to access both current and 24 hour ESF Statistics. The “Current Statistics” column displays the counts for the current time interval (maximum fifteen minutes). The “24 Hour Statistics” column displays the counts for the preceding 24 hour period.

Procedure

To access the ESF Statistics screen:

1. Place your cursor on any *Active* link in the Diagnostics Manager Menu and type **S**. A new menu appears (see above).

ESF Statistics Field Descriptions

Errored secs: The occurrence of a Loss of Frame or a CRC6 error in a one-second period is known as an errored second. This field represents the number of errored seconds that have occurred.

Failed secs (UAS): Each second period during the occurrence of a Failed Signal State (ten consecutive errored seconds) is known as a failed second. This field represents the number of failed seconds that have occurred.

Severely error secs: A one-second period in which three hundred twenty (320) or more CRC6 errors have occurred is known as a severely errored second. This field represents the number of severely errored seconds that have occurred.

Bursty error secs: A one-second period in which more than one but less than 320 CRC6 errors has occurred is known as a bursty errored second. This field represents the number of bursty errored seconds that have occurred.

Loss of frame cnt: A loss of frame occurs when either Network equipment or the DTE senses errors in the framing pattern. Depending upon the equipment, this occurs when any 2 of 4, 2 of 5, or 3 of 5 consecutive terminal framing bits received contain bit errors in the framing pattern.

Time in interval: A timer that tracks the number of seconds in one 15-minute interval.

# of Valid intervals: A counter that tracks the total number of 15 minute intervals in a 24 hour period (up to 96).

ESF status: This field defines the status of the T1 line. The status is defined by an eight digit number that is described below:

FU0000L0

Digit #1 - “F” or “0” where “F” indicates Failed Signal State (FSS) if “U” or “L” is true.

Digit #2 - “U” or “0” where “U” indicates an unavailable signal state.

Digit #3 through #6 and #8 are always “0.”

Digit #7 - “L” or “0” where “L” indicates that the T1 line is in loop.

```
Eastern Research, Inc.          DNX - T1/E1         Slot:02    Help = [?]

                    ESF registers For Port#: 1
INT ES  FS  SES BES    INT ES  FS  SES BES    INT ES  FS  SES BES
-------------------------------------------------------------------
01. 000 000 000 000    17. 000 000 000 000    33. 000 000 000 000
02. 000 000 000 000    18. 000 000 000 000    34. 000 000 000 000
03. 000 000 000 000    19. 000 000 000 000    35. 000 000 000 000
04. 000 000 000 000    20. 000 000 000 000    36. 000 000 000 000
05. 000 000 000 000    21. 000 000 000 000    37. 000 000 000 000
06. 000 000 000 000    22. 000 000 000 000    38. 000 000 000 000
07. 000 000 000 000    23. 000 000 000 000    39. 000 000 000 000
08. 000 000 000 000    24. 000 000 000 000    40. 000 000 000 000
09. 000 000 000 000    25. 000 000 000 000    41. 000 000 000 000
10. 000 000 000 000    26. 000 000 000 000    42. 000 000 000 000
11. 000 000 000 000    27. 000 000 000 000    43. 000 000 000 000
12. 000 000 000 000    28. 000 000 000 000    44. 000 000 000 000
13. 000 000 000 000    29. 000 000 000 000    45. 000 000 000 000
14. 000 000 000 000    30. 000 000 000 000    46. 000 000 000 000
15. 000 000 000 000    31. 000 000 000 000    47. 000 000 000 000
16. 000 000 000 000    32. 000 000 000 000    48. 000 000 000 000

                                          [N]ext Page
```

16-13. ESF Registers screen.

ESF [R]egisters

The ESF Registers Menu gives the same information as the ESF Statistics but it is broken down by port for each of the ninety-six 15-minute intervals in the preceding 24-hour period. The ESF Registers Menu for the selected port is shown on the next page.

Procedure

To access the ESF Registers screen:

1. Place your cursor on any *Active* link in the Diagnostics Manager Menu and type **R**. A new menu appears (see above).

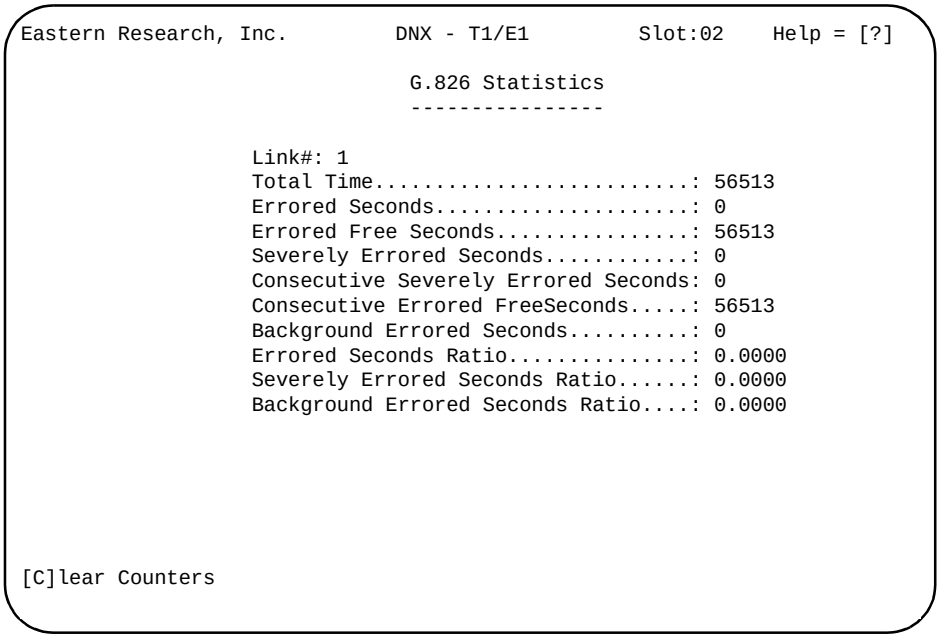
ESF Register Field Descriptions

Errored Seconds (ES): The occurrence of a Loss of Frame or a CRC6 error in a one-second period is known as an errored second. This field represents the number of errored seconds that have occurred.

Failed Seconds (FS): Each second period during the occurrence of a Failed Signal State (ten consecutive errored seconds) is known as a failed second. This field represents the number of severely errored seconds that have occurred.

Severely Errored Seconds (SES): A one-second period in which three hundred twenty (320) or more CRC6 errors have occurred is known as a severely errored second. This field represents the number of severely errored seconds that have occurred.

Bursty Errored Seconds (BES): A one-second period in which more than one but less than 320 CRC6 errors has occurred is known as a bursty errored second. This field represents the number of bursty errored seconds that have occurred.


Eastern Research, Inc. DNX - T1/E1 Slot:02 Help = [?]
G.826 Statistics
Link#: 1
Total Time.....: 56513
Errored Seconds.....: 0
Errored Free Seconds.....: 56513
Severely Errored Seconds.....: 0
Consecutive Severely Errored Seconds: 0
Consecutive Errored FreeSeconds.....: 56513
Background Errored Seconds.....: 0
Errored Seconds Ratio.....: 0.0000
Severely Errored Seconds Ratio.....: 0.0000
Background Errored Seconds Ratio....: 0.0000
[C]lear Counters

16-14. G.826 Statistics screen.

[G].826

This status screen displays the statistics of the performance of the link for the duration of time the link is up and running.

Procedure

To access the G.826 Statistics screen:

1. Place your cursor on any *Active* link in the Diagnostics Manager Menu and type **G**. A new menu appears (see above).

G.826 STATISTICS FIELD DESCRIPTIONS

Refer to the *ITU-T Standardized Specifications*, dated 08/96, for a more detailed description of the G.826 statistics.

Total Time: the duration of time the link is up and running.

Errored Seconds: a one second period with one or more errored blocks or at least one defect.

Errored Free Seconds: a one second period of time the link was error free.

Severly Errored Seconds: a subset of ES, SES is a one second period which contains ≥30% errored blocks or at least one defect.

Consecutive Severely Errored Seconds: a continuous occurrence of SES, in a one second intervals, which contains ≥30% errored blocks or at least one defect.

Consecutive Errored Free Seconds: a display of consecutive one second period intervals that did not have defects or errors on the link.

Background Errored Seconds: a one second period with one or more errored blocks or at least one defect not occurring as part of the ES.

Errored Seconds Ratio: the ratio of ES to total seconds in available time during a fixed measurement interval.

Severely Errored Seconds Ratio: the ratio of SES to total seconds in available time during a fixed measurement interval.

Background Errored Seconds Ratio: the ratio of background block errors to total blocks in available time during a fixed measurement interval. The count of total blocks excludes all blocks during SES.

Procedure

To monitor the integrity of the backplane on the Octal T1/E1 module:

1. From the Main Menu, select Node Summary.
2. Select a Slot that has been configured for Octal T1/E.
3. From the Octal T1/E1Main Menu, select Diagnostics. Place your cursor on Diagnostics and press **<Enter>**.
4. From the Diagnostics menu, select Backplane Check. Place your cursor on the Backplane Check field and press **<Enter>**. The following screen appears.

```
Eastern Research, Inc.  DNX - Octal T1/E1        Slot:02    Help = [?]

                        Monitor Backplane Integrity

       Slot#       Slot#       Pattern     Pattern   Status
Slot#  Address     Received    Address     Received  (Ignore for QHS)
-------------------------------------------------------------------------
01     0x00E02807    01        0x00E02808    0F       ... OK ...
02     0x00E02809    02        0x00E0280A    0F       ... OK ...
03     0x00E0280B    03        0x00E0280C    04       ... OK ...
04     0x00E0280D    05        0x00E0280E    05
05     0x00E0280F    01        0x00E02810    01
06     0x00E02811    01        0x00E02812    01
07     0x00E02813    01        0x00E02814    01
08     0x00E02815    01        0x00E02816    01
09     0x00E02817    01        0x00E02818    01
10     0x00E02819    01        0x00E0281A    01
11     0x00E0281B    01        0x00E0281C    01
```

16-15. Monitor Backplane Integrity Menu.

Monitor Backplane Integrity

This screen is intended as a diagnostic tool for the manufacturer. It displays the status of the DNX backplane.

Procedure

To check the System Status on the Octal T1/E1 module:

1. From the Main Menu, select Node Summary.
2. Select a Slot that has been configured for Octal T1/E1.
3. From the Octal T1/E1Main Menu, select Diagnostics. Place your cursor on Diagnostics and press **<Enter>**.
4. From the Diagnostics menu, select System Status. Place your cursor on the Monitor Backplane Status field and press **<Enter>**. The following screen appears.

```
Eastern Research, Inc.      DNX - Octal T1/E1   Slot:02    Help = [?]


                          Monitor Backplane Status
Description                                                    Transitions
-------------------------------------------------------------------------
Current Backplane Status.................: On the Bus

Card Service Status......................: In Service
System Ready To Go In Service............: Yes                3
System Clock Status......................: Present            0
Frame SYNC Signal Status.................: Present            0
Too Many Backplane Time Slots ON.........: No                 0
Receive TSFM Map.........................: Yes                3
Hardware Access to Memory................: Enable









Card In Service = [I]
Card Out Of Service = [O]
Reset Counters = [R]
```

16-16. Monitor Backplane Status Menu.

Monitor Backplane Status

NOTE: The fields shown in this menu are the default settings and should not be accessed or configured unless you are established as a high level user (e.g., Developer); they are for debugging purposes only. It is strongly suggested that you do not tamper with these fields unless prompted to do so by an Eastern Research Technical Support Representative.

MONITOR BACKPLANE STATUS FIELD DESCRIPTIONS

Current Backplane Status: On-line/Off-line status that enables the card to communicate with the DNX Backplane.

Card Service Status: Shows the status of the board.

System Ready To Go In Service: Shows whether the card is good or bad.

System Clock Status: A watchdog timer that monitors the integrity of the backplane clock. This clock is critical to backplane operation.

Frame SYNC Signal Status: A watchdog timer that monitors the integrity of the sync signal that coordinates data flow on the backplane. Critical to backplane operation.

Too Many Backplane Time Slots ON: A watchdog timer that monitors access to the backplane by this card. Protects the system from a faulty card corrupting data on the backplane.

Receive TSFM Map: Signals the hardware when to use the backplane.

Hardware Access to Memory: A way for the software to disable the memory for testing purposes.

The following hot keys invoke additional screens and/or functions:

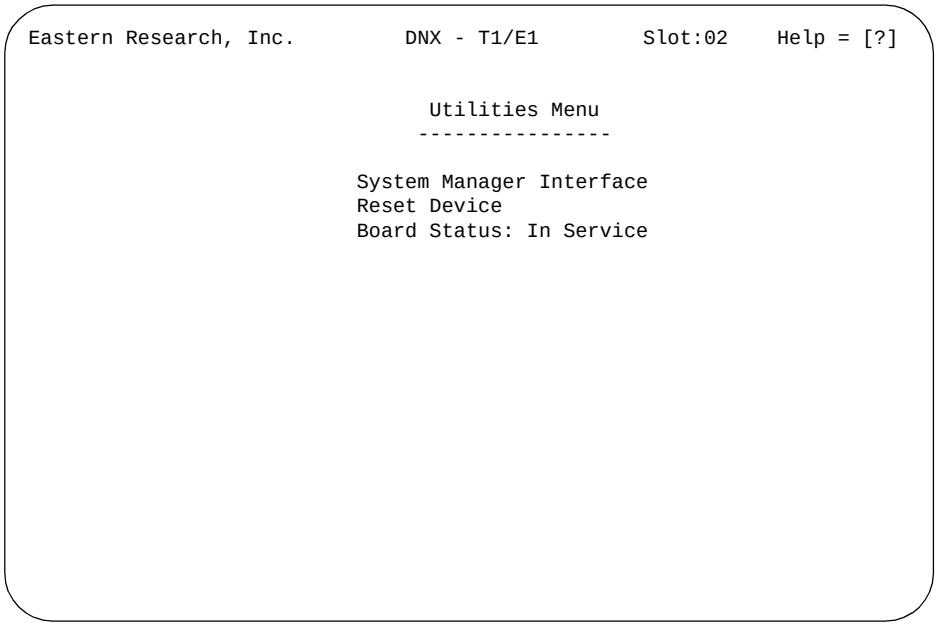
- Card In Service = **[I]**
- Card Out Of Service = **[O]**
- Reset Counters = **[R]**

OCTAL T1/E1 UTILITIES

Procedure

To access the Octal T1/E1 Utilities, follow these steps:

1. From the DNX Main Menu, select Node Summary.
2. Select a Slot that has been configured for Octal T1/E1.
3. From the Octal T1/E1 Main Menu, select Utilities. Place your cursor on the Utilities field and press **<Enter>**. The following screen appears.



16-17. Utilities Menu.

Procedure

To view System Manager Interface Statistics, such as map checksum or byte count, follow these steps:

1. From the DNX Main Menu, select Node Summary.
2. Select a Slot that has been configured for Octal T1/E1.
3. From the Octal T1/E1 Main Menu, select Utilities. Place your cursor on the Utilities field and press **<Enter>**.
4. From the Utilities menu, select System Manager Interface Status. Place your cursor on the System Manager Interface Status field and press **<Enter>**. The following screen appears.

```
Eastern Research, Inc.    DNX - Octal T1/E1     Slot:02    Help = [

                        System Manager Interface Stat

------------------------------------------------------------------------
                  Configuration Map sequence number.......:
                  Downloaded Config Map sequence number...:
                  Configuration Map Checksum..............:
                  Configuration Map Byte Count............:
                  Number of Configuration Map changes.....:
                  Number of Configuration Maps downloads..:
                  System Manager Level Identifier.........: 6
                  System Manager Id.......................: 1
                  System Files sequence number............:
```

16-18. System Manager Interface Status.

The System Manager Interface Status is a view-only screen that basically shows the communications between the SMC board and all of the loaded application modules.

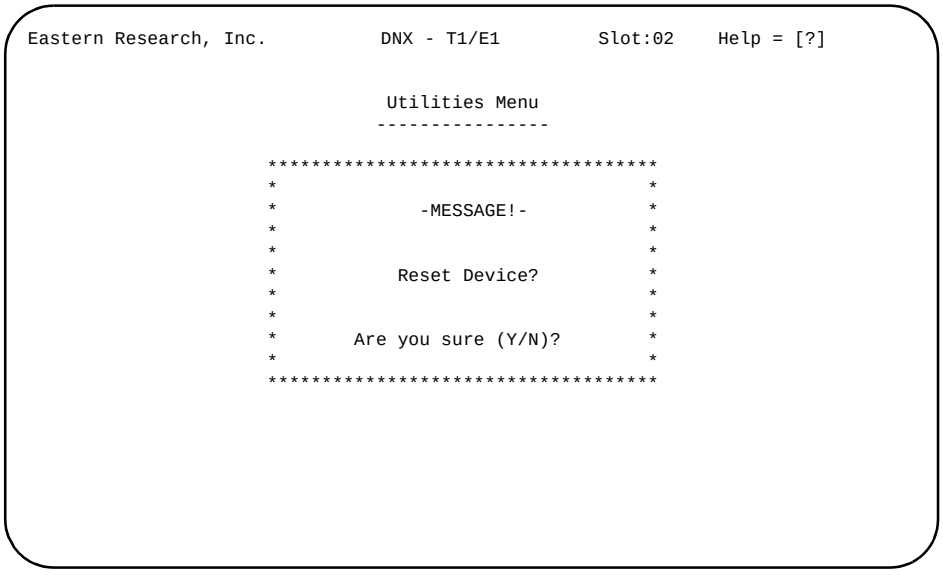
OCTAL T1/E1 UTILITIES

Reset Device causes the card to initialize in the same manner as power up. During this boot up cycle, no user data will flow. Since the configuration resides on the SMC, connections will be restored.

Procedure

To Reset the device, follow these steps:

1. From the DNX Main Menu, select Node Summary.
2. Select a Slot that has been configured for Octal T1/E1.
3. From the Octal T1/E1 Main Menu, select Utilities. Place your cursor on the Utilities field and press **<Enter>**.
4. From the Utilities menu, select Reset Device. Place your cursor on the Reset Device field and press **<Enter>**. The following screen appears.



16-19. Reset Device screen.

5. Upon resetting the device, type **X**. A new message appears: “Reset Device? Are you sure (Y/N)?”.

OCTAL T1/E1 ABOUT MENU

Procedure

To display identification information for the Octal T1/E1 module:

1. From the Main Menu, select Node Summary.
2. Select a Slot that has been configured for Octal T1/E1.
3. From the Octal T1/E1 Main Menu, select About. Place your cursor on the About field and press **<Enter>**. The following screen appears.

```
Eastern Research, Inc.      DNX - Octal T1/E1    Slot:02    Help = [?]


                                    About
                                   -------


                           Version.........: 01.00
                           Release Date.....: March 8, 1999
                           Checksum.........: 3413
                           Xilinx Version...: wb_xlx11
                           Front Card Type..: Octal T1/E1
                           Front Card Rev...: 0
                           Rear Card Type...: Octal E1 120 OHM
                           Rear Card Rev....: 0
```

16-20. Sample About Menu.

About Field Descriptions

Version: This is the software version current in the Octal T1/E1's flash memory.

Release Date: The engineering release to production.

Checksum: The sum of all bytes in the Octal T1/E1 card's flash memory at power up.

XILINX Version: The hardware version of downloadable, programmable devices.

Front Card Type: Displays the type of board in the system.

Front Card Rev: Displays the board's revision level.

Rear Card Type: Displays the type of board in the system.

Rear Card Rev: Displays the board's revision level.

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17 Octal Voice

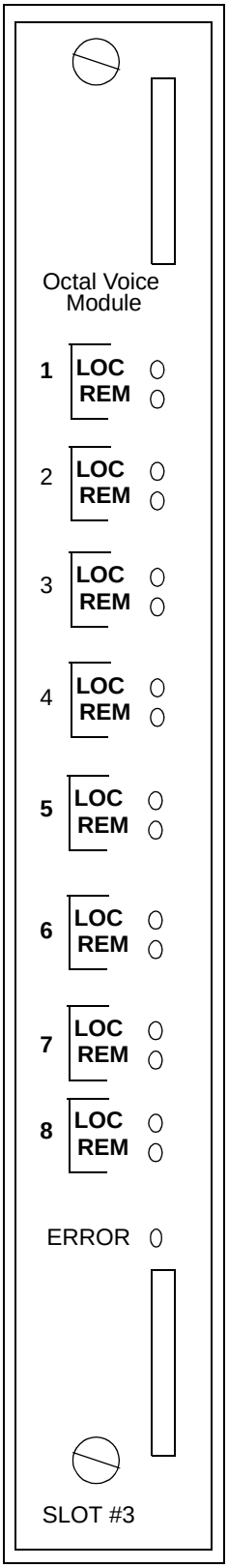
Three rear card interface modules are available for use with the Octal Voice Module. **A -48V must be supplied to the DNX nest for any voice application to function.**

- **Octal 4 Wire E&M** - provides eight 4 wire interfaces via two 50-pin Telco type connectors. Leads supported include Tip, Ring, Tip1, Ring1, E, M, SB, and SG. Applications include 2/4 Wire T0 analog data applications, and 2/4 Wire E&M voice trunks.

- **Octal 2 Wire FXO/DPT** - provides eight Foreign Exchange Office (FXO) or Dial Pulse Temination (DPT) voice interfaces via a 50-pin Telco type connector. The Octal 2W/FXO/DPT can sink and detect ringing or sink and detect forward or reverse battery current dependent on configuration. The 2W/FXO/DPT can be employed to extend dial tone to a remote PBX or for support of Direct Inward Dialing (DID).

- **Octal 2 Wire FXS** - provides eight Foreign Exchange Station (FXS) voice interfaces via a 50-pin Telco type connector. The Octal 2W/FXS supports distinctive ringing, and can utilize loop start, private line auto ring (PLAR) or ground start connections to conventional analog telephone devices. Ring generation is integral to the 2W/FXS.

LED DISPLAY



During initialization, Port 1's LOC(ation) and REM(ote) LEDs should toggle ON and OFF to indicate Xilink load in progress. Once the files are loaded, LOC and REM LEDs should turn OFF.

There are two LEDs per port for signalling information. One LED is referred to as *LOC* to indicate hook status received from the backplane; the other LED is labeled as *REM* to indicate hook status received from the trunk. These LEDs are turned ON when an Off-hook condition is detected.

The LOC and REM LEDs of all 8 ports flash to indicate system software download in progress.

If there is only one SMC card in the system, and it is removed and then plugged back in, all of the boards will reset.

A single Error LED indicates the voice card status. The Error LED blinks when there is a missing or invalid rear card in the system.

If the system is Off-line or Off the Buss, the Error LED flashes.

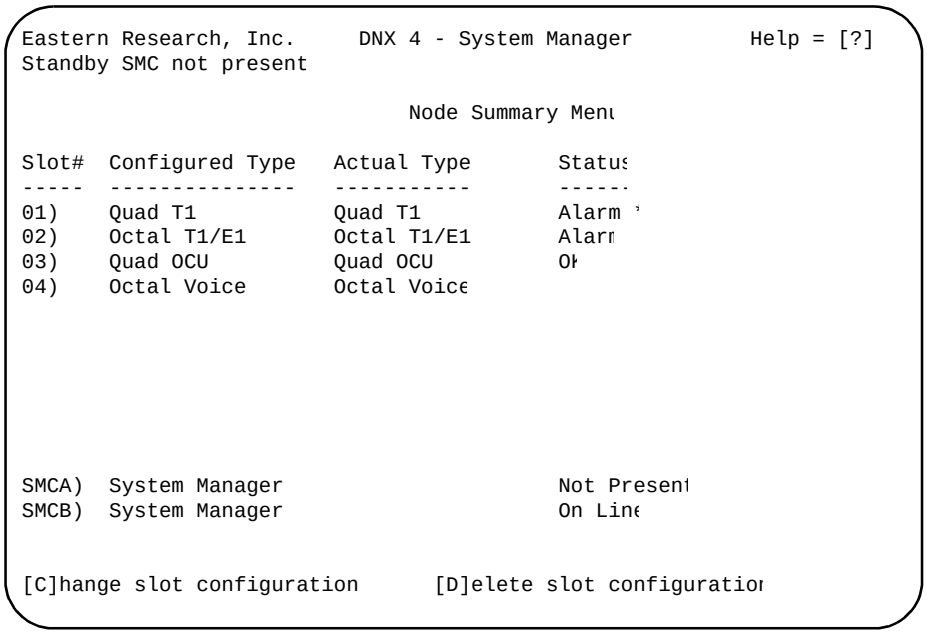
The system is Off-line when the following conditions occur:

- Card Out of Service (All LEDs flash to indicate a *Card Out of Service* condition)
- No Connection Map received
- Invalid Rear Card present
- SMC Clock Failure
- Missing Frame SYNC signal
- too many Time Slots Active
- Hardware write to Backplane Memory inhibited

Before You Begin

In order to view the menus associated with the Octal Voice module, the following must be performed:

- the Octal Voice card must be in a slot in the equipment nest
- the slot must be configured for module type: Octal Voice
- the *Configured Type* and *Actual Type* noted on the Node Summary Menu must be Octal Voice


Eastern Research, Inc. DNX 4 - System Manager Help = [?]
Standby SMC not present
Node Summary Menu
Slot# Configured Type Actual Type Status
01) Quad T1 Quad T1 Alarm
02) Octal T1/E1 Octal T1/E1 Alarm
03) Quad OCU Quad OCU OK
04) Octal Voice Octal Voice
SMCA) System Manager Not Present
SMCB) System Manager On Line
[C]hange slot configuration [D]elete slot configuration

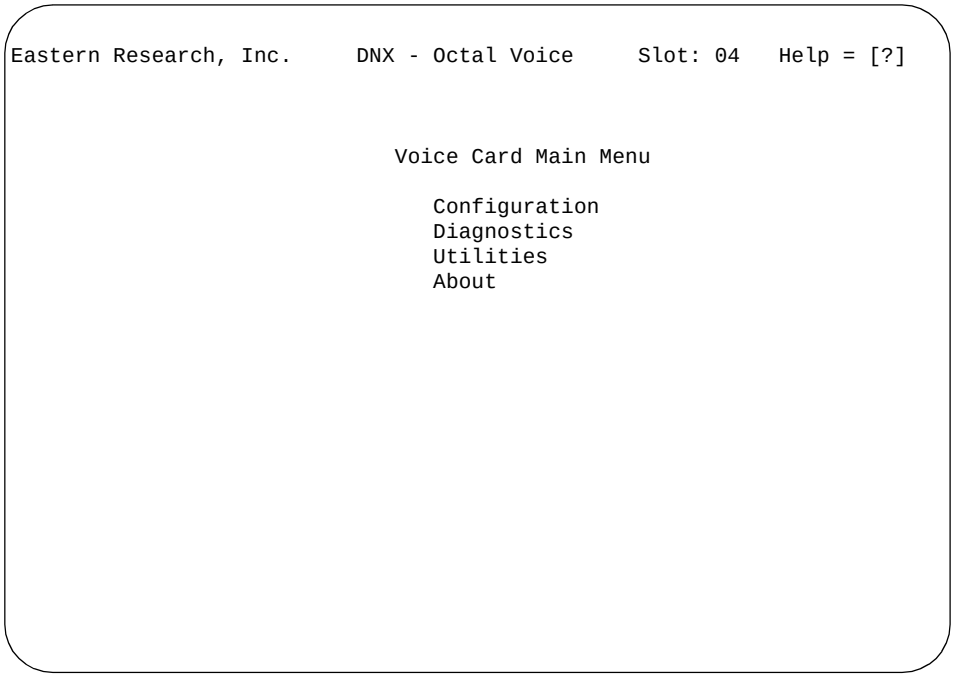
17-1. Node Summary Menu.

NOTE:

- **If the slot does not show a "Configured Type," refer to "Configuring a Slot" in Chapter 3 of this manual.**
- **This chapter is written from the perspective of the *ADMINISTRATOR* who employs the User Profile Manager Menu to add, change, or delete user information. Refer to Chapter 3 for an explanation of security levels.**
- **To access the User Profile Manager Menu, from the DNX Main Menu, select System Configuration, then select Users Menu. The Users Profile Manager Menu displays.**
- **To configure the Users Profile Manager for security purposes, navigate to the Users Menu.**

OCTAL VOICE MAIN MENU

The Octal Voice Main Menu provides options that enable you to configure the Octal Voice module, run diagnostics, access utilities, and display module identification (software revision levels).



17-2. Octal Voice Card Main Menu.

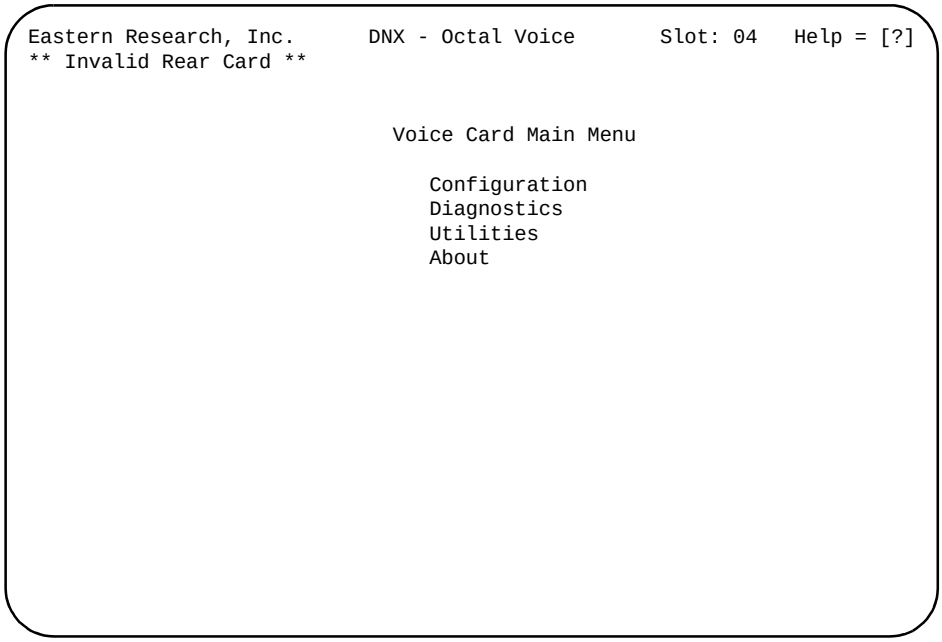
CONFIGURING THE OCTAL VOICE REAR CARD - E&M

When a rear card is first plugged into the DNX, the Octal board resets and an **Invalid Rear Card** message appears on the screen of the Voice Card Main Menu (see next screen). All menus are inaccessible until reset is complete. This takes approximately 45 seconds.

Procedure

To configure a rear card type:

1. Place your cursor on the Configuration field and press **<Enter>.**



17-3. Voice Card Main Menu.

```
Eastern Research, Inc.    DNX - Octal Voice      Slot: 04   Help = [
** Invalid Rear Card *
                        Octal Voice Card Configuratic

Port# Name    Port Status      Port Type   Codec Mode  Rx Gain  Tx Ga
-------------------------------------------------------------------
01    Port01  Out of Service   Loop Start  mu-Law       0 dB     0
02    Port02  Out of Service   Loop Start  mu-Law       0 dB     0
03    Port03  Out of Service   Loop Start  mu-Law       0 dB     0
04    Port04  Out of Service   Loop Start  mu-Law       0 dB     0
05    Port05  Out of Service   Loop Start  mu-Law       0 dB     0
06    Port06  Out of Service   Loop Start  mu-Law       0 dB     0
07    Port07  Out of Service   Loop Start  mu-Law       0 dB     0
08    Port08  Out of Service   Loop Start  mu-Law       0 dB     0

Configured Rear Card Type: Octal Voice FXO/DPT Operation Mode: PCM64Kb
Actual Rear Card Type....: Invalid    Backplane Status: Off the Bu
```

17-4. Voice Card Configuration Menu.

Procedure (cont.)

2. At the Configured Rear Card Type field press **<Enter>**.
3. Press **<Enter>** again, to scroll through the available options, which are:
   - **E&M (selected)**
   - FXO
   - FXS
4. Type **X** to save your selection. A screen message appears: “Alert Please wait while the card prepares to reset! Press any key to continue”.
5. Upon pressing any key, the system returns to the Node Summary Menu. Place your cursor on Octal Voice and press **<Enter>**.

NOTE: The Octal Voice configuration files are stored on the System Manager Card. When an Octal Voice card is replaced, the old configuration is preserved.

CONFIGURING THE OCTAL VOICE MODULE PARAMETERS

Procedure

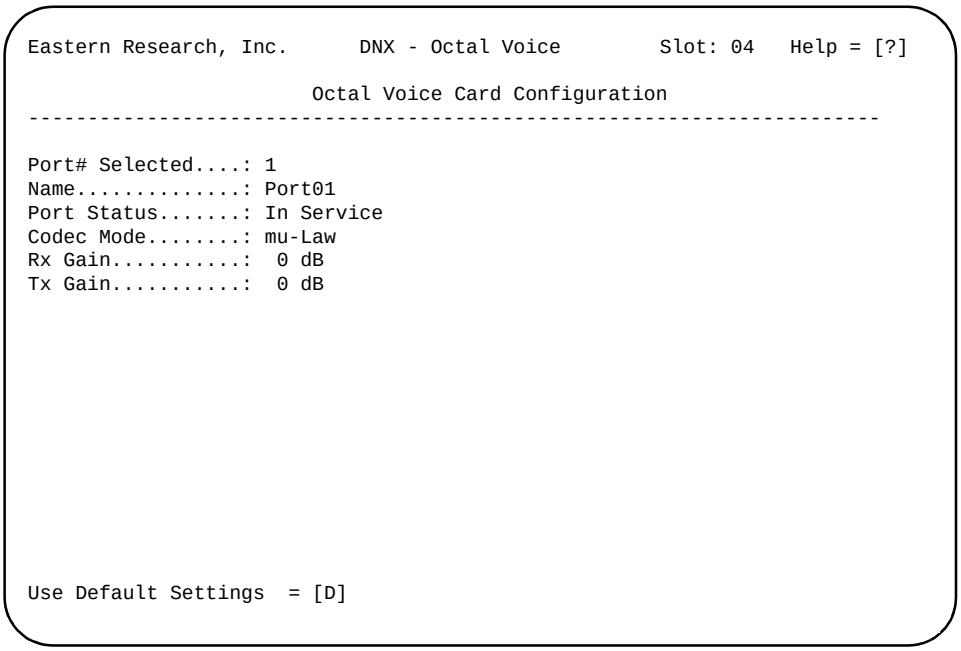
To configure the Octal Voice module's parameters:

1. From the Main Menu, select Node Summary.
2. Select a slot that has been configured for Octal Voice.
3. From the Voice Card Main Menu, select Configuration. Place your cursor on the Configuration field and press **<Enter>**. The following screen appears.

```
Eastern Research, Inc.    DNX - Octal Voice       Slot: 04   Help = [?]

                        Octal Voice Card Configuration

Port# Name    Port Status  Type    Mode      Codec Mode  Rx Gain Tx Gain
-------------------------------------------------------------------------
01    Port01  In Service   E&M II  Switching mu-Law       0 dB   0 dB
02    Port02  In Service   E&M II  Switching mu-Law       0 dB   0 dB
03    Port03  In Service   E&M II  Signaling mu-Law       0 dB   0 dB
04    Port04  In Service   E&M II  Signaling mu-Law       0 dB   0 dB
05    Port05  In Service   E&M II  Signaling mu-Law       0 dB   0 dB
06    Port06  In Service   E&M II  Signaling mu-Law       0 dB   0 dB
07    Port07  In Service   E&M II  Signaling mu-Law       0 dB   0 dB
08    Port08  In Service   E&M II  Signaling mu-Law       0 dB   0 dB

Configured Rear Card Type: Octal Voice E&M  Operation Mode..: PCM 64Kbps
Actual Rear Card Type....: Octal Voice E&M   Backplane Status: On the Bus
```

17-5. E&M Configuration Screen.

4. Place your cursor on the port you want to configure and press **<Enter>**. The following submenu appears.


Eastern Research, Inc. DNX - Octal Voice Slot: 04 Help = [?]
Octal Voice Card Configuration
Port# Selected....: 1
Name.....: Port01
Port Status.....: In Service
Codec Mode.....: mu-Law
Rx Gain.....: 0 dB
Tx Gain.....: 0 dB
Use Default Settings = [D]

17-6. E&M Port Configuration submenu.

CONFIGURATION FIELD DESCRIPTIONS

Port #: The port to be configured.

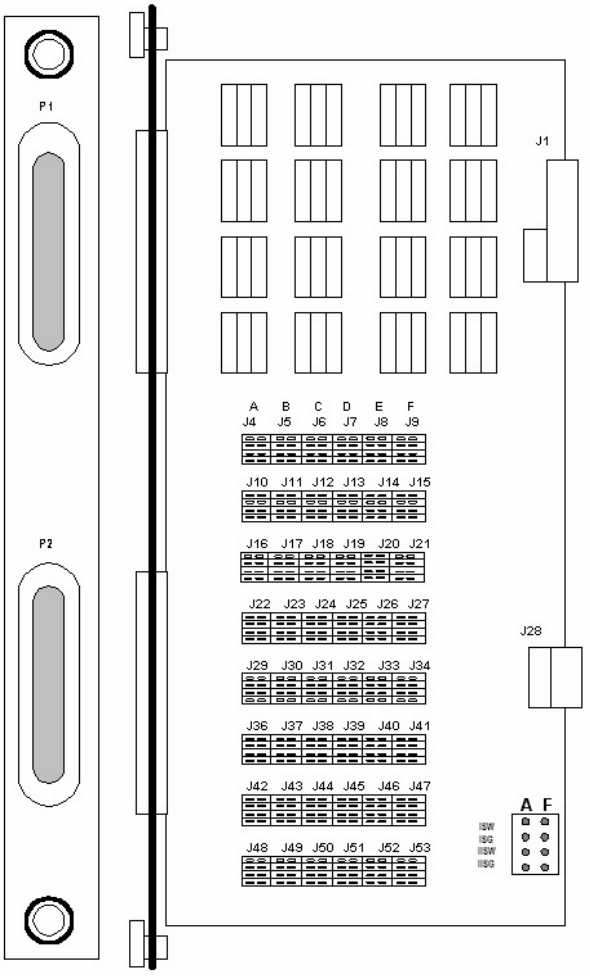
Name: (text field) This is a user-defined field. Any name up to 11 characters in length can be entered to identify each port on the Octal Voice. Some users find it beneficial to use circuit numbers to name the ports.

Port Status: (option field) This field determines the status of the port. The status will either be *"In Service"* or *"Out Of Service"*.

Port Type: (option field) Depending upon the rear card type, the following port types are available under **E&M**:

- ***E&M Rear Card*** - the trunk type and trunk mode settings for the ports are selected by setting the appropriate jumper blocks in the rear card; it is not soft-configurable. There are four possible settings that include E&M type I in switching mode; E&M type II in switching mode; E&M type I in signalling mode; and E&M type II in signalling mode. The default setting is E&M type I in signalling mode (refer to the diagram below).

CAUTION: **Care should be taken when removing or installing jumpers.**



Information on the E & M Rear Interface Card

The top connector P1 controls channels 1 to 6, connector P2 controls channels 7 and 8.
Each of the channels use a total of 4 pairs, (8 pins) per connection.

Channel	1	2	3	4	5	6	7	8
Tx Tip	P1-26	P1-30	P1-34	P1-38	P1-42	P1-46	P2-26	P2-30
Tx Ring	P1- 1	P1- 5	P1-13	P1-17	P1-17	P1-21	P2- 1	P2- 5
Rcv Tip	P1-27	P1-31	P1-35	P1-39	P1-43	P1-47	P2-27	P2-31
Rcv Ring	P1- 2	P1- 6	P1-10	P1-14	P1-18	P1-22	P2- 2	P2- 6
E	P1-28	P1-32	P1-36	P1-40	P1-44	P1-48	P2-28	P2-32
M	P1- 3	P1- 7	P1-11	P1-15	P1-19	P1-23	P2- 3	P2- 7
SB	P1-29	P1-33	P1-37	P1-41	P1-45	P1-49	P2-29	P2-33
SG	P1- 4	P1- 8	P1-12	P1-16	P1-20	P1-24	P2- 4	P2- 8

Table for Jumper setting

	A J#	B J#	C J#	D J#	E J#	F J#
Type 1 Signaling	- -	- -	- -	- -	- -	- -
Type 1 Switching	- -	- -	- -	- -	- -	- -
Type II Signaling	- -	- -	- -	- -	- -	- -
Type II Switching	- -	- -	- -	- -	- -	- -

Jumper shorts horizontally across the entire row

17-7. Jumper Settings for E&M Interface Card.

Codec Mode: (option field) a coding algorithm. Select mu-law (default) for North American and Japan; A-Law for the rest of the world.

Rx Gain: (option field) adjusts the PCM receive signal gain from -6dB to +8dB.

Tx Gain: (option field) adjusts the PCM transmit signal gain from -6dB to +8dB.

Use Default Settings = [D] : (option field) press **D** to return your selections to the default settings.

Configured Rear Card Type and Actual Rear Card Type: Select and configure the rear card type to E&M, FXO, or FXS. If the configured type is different from the actual rear card type detected by the system, then *only* change the rear card type setting.

NOTE: If the configuration file is not present, the default setting for the rear card is FXO.

Operation Mode: The operation mode is PCM, 64Kbps.

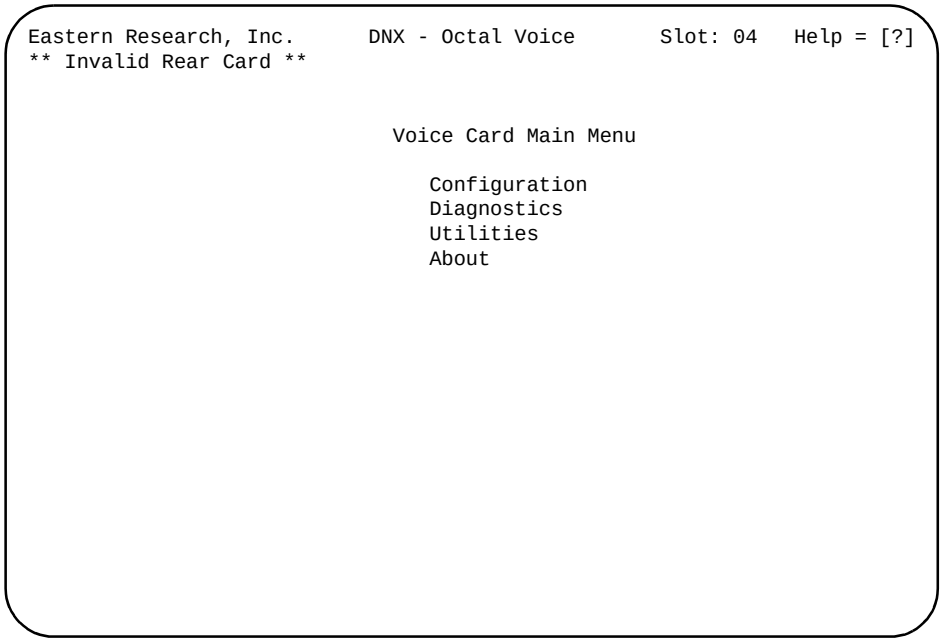
Backplane Status: A status that enables the card to communicate with the DNX Backplane.

CONFIGURING THE OCTAL VOICE REAR CARD - FXO

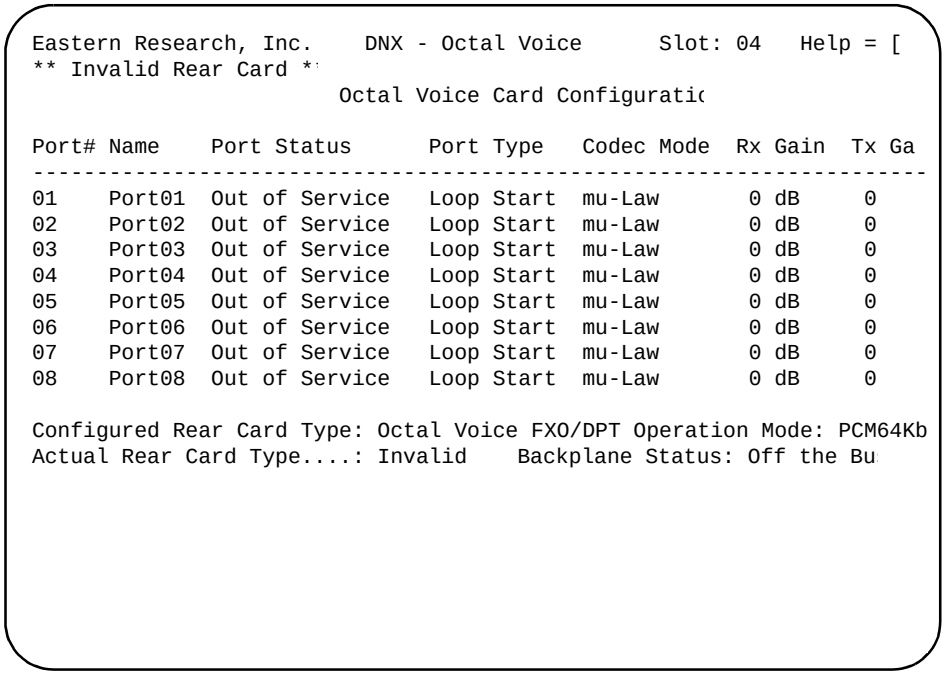
Procedure

To configure the *FXO* rear interface card:

1. Physically remove the current rear card (in this case, the E&M interface card) from the DNX chassis and replace it with another (in this case, the FXO interface card).
2. At the Node Summary Menu, place your cursor on Octal Voice and press **<Enter>.** The Voice Card Main Menu appears (see the following screen).
3. Place your cursor on the Configuration field and press **<Enter>.**



17-8. Voice Card Main Menu.


Eastern Research, Inc. DNX - Octal Voice Slot: 04 Help = [
** Invalid Rear Card *
Octal Voice Card Configuratic
Port# Name Port Status Port Type Codec Mode Rx Gain Tx Ga
01 Port01 Out of Service Loop Start mu-Law 0 dB 0
02 Port02 Out of Service Loop Start mu-Law 0 dB 0
03 Port03 Out of Service Loop Start mu-Law 0 dB 0
04 Port04 Out of Service Loop Start mu-Law 0 dB 0
05 Port05 Out of Service Loop Start mu-Law 0 dB 0
06 Port06 Out of Service Loop Start mu-Law 0 dB 0
07 Port07 Out of Service Loop Start mu-Law 0 dB 0
08 Port08 Out of Service Loop Start mu-Law 0 dB 0
Configured Rear Card Type: Octal Voice FXO/DPT Operation Mode: PCM64Kb
Actual Rear Card Type....: Invalid Backplane Status: Off the Bu

17-9. Voice Card Configuration Menu.

Procedure (cont.)

2. At the Configured Rear Card Type field press **<Enter>**.
3. Press **<Enter>** again, to scroll through the available options, which are:
   - E&M
   - **FXO (selected)**
   - FXS
4. Type **X** to save your selection. A screen message appears: “MESSAGE! Rear Card Type changed, RESET the card? Are you sure? (Y/N)?” Upon selecting **Y**es, another message appears: “ALERT! Please wait while the card prepares to reset! Press any key to continue”.
5. Upon pressing any key, the system returns to the Node Summary Menu. Place your cursor on Octal Voice and press **<Enter>**.

NOTE: The Octal Voice configuration files are stored on the System Manager Card. When an Octal Voice card is replaced, the old configuration is preserved.

CONFIGURING THE OCTAL VOICE MODULE PARAMETERS

Procedure

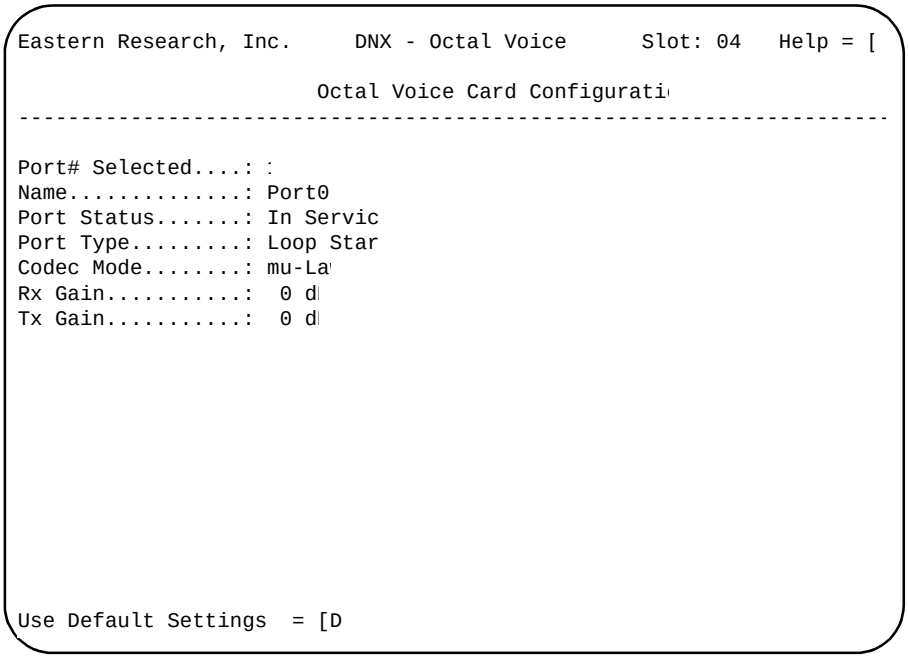
To configure the Octal Voice module's parameters:

1. From the Main Menu, select Node Summary.
2. Select a slot that has been configured for Octal Voice.
3. From the Voice Card Main Menu, select Configuration. Place your cursor on the Configuration field and press **<Enter>**. The following screen appears.

```
Eastern Research, Inc.    DNX - Octal Voice      Slot: 04   Help = [
                          Octal Voice Card Configuratio

Port# Name   Port Status     Port Type    Codec Mode  Rx Gain  Tx Ga
-------------------------------------------------------------------
01    Port01 In Service      Loop Start   mu-Law      0 dB     0 d
02    Port02 Out of Service  Loop Start   mu-Law      0 dB     0 d
03    Port03 Out of Service  Loop Start   mu-Law      0 dB     0 d
04    Port04 Out of Service  Loop Start   mu-Law      0 dB     0 d
05    Port05 Out of Service  Loop Start   mu-Law      0 dB     0 d
06    Port06 Out of Service  Loop Start   mu-Law      0 dB     0 d
07    Port07 Out of Service  Loop Start   mu-Law      0 dB     0 d
08    Port08 Out of Service  Loop Start   mu-Law      0 dB     0 d

Configured Rear Card Type:Octal Voice FXO/DPT Operation Mode..:PCM64Kb
Actual Rear Card Type...:Octal Voice FXO/DPT Backplane Status:On the Bu
```

17-10. FXO Configuration Screen.

4. Place your cursor on the port you want to configure and press **<Enter>**. The following submenu appears.


Eastern Research, Inc. DNX - Octal Voice Slot: 04 Help = [
Octal Voice Card Configurati
Port# Selected....: :
Name.....: Port0
Port Status.....: In Servic
Port Type.....: Loop Star
Codec Mode.....: mu-La
Rx Gain.....: 0 d
Tx Gain.....: 0 d
Use Default Settings = [D

17-11. FXO Configuration Submenu.

CONFIGURATION FIELD DESCRIPTIONS

Port #: The port to be configured.

Name: (text field) This is a user-defined field. Any name up to 14 characters in length can be entered to identify each port on the Octal Voice. Some users find it beneficial to use circuit numbers to name the ports.

Port Status: (option field) This field determines the status of the port. The status will either be *"In Service"* or *"Out Of Service"*.

Port Type: (option field) Depending upon the rear card type, the following port types are available under **FXO**:

- ***FXO Rear Card*** - the port type setting should be under the software control. Select from Loop Start and Ground Start type port configurations. The default port type setting should be the Loop Start.

Codec Mode: (option field) a coding algorithm. Select mu-law (default) for North American and Japan; A-Law for the rest of the world.

Rx Gain: (option field) adjusts the PCM receive signal gain from -6dB to +8dB.

Tx Gain: (option field) adjusts the PCM transmit signal gain from -6dB to +8dB.

Use Default Settings = [D] : (option field) press **D** to return your selections to the default settings.

Configured Rear Card Type and Actual Rear Card Type: Select and configure the rear card type to E&M, FXO, or FXS. If the configured type is different from the actual rear card type detected by the system, then *only* change the rear card type setting.

NOTE: If the configuration file is not present, the default setting for the rear card is FXO.

Operation Mode: The operation mode is PCM, 64Kbps.

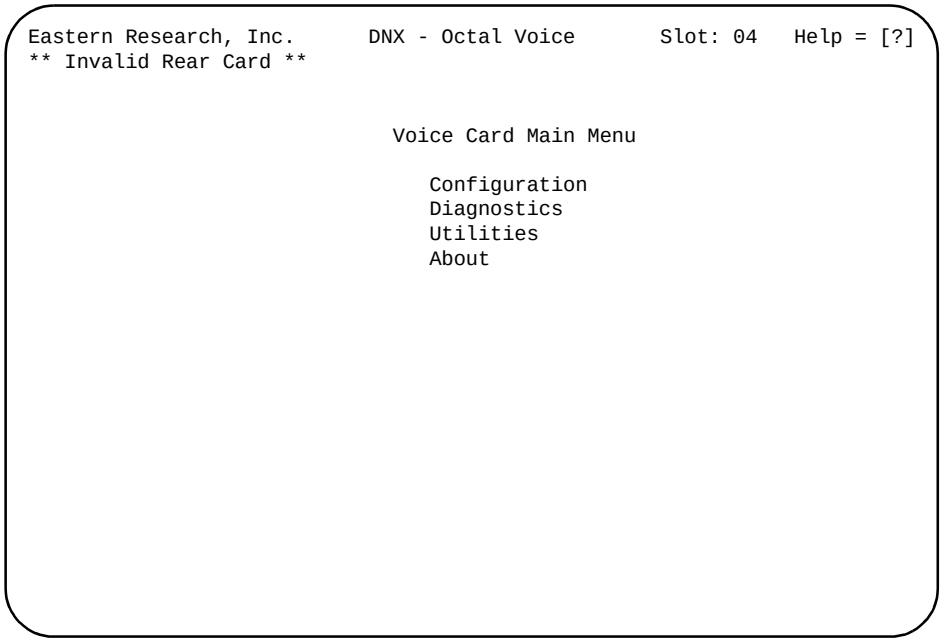
Backplane Status: A status that enables the card to communicate with the DNX Backplane.

CONFIGURING THE OCTAL VOICE REAR CARD - FXS

Procedure

To configure the *FXS* rear interface card:

1. Physically remove the current rear card (in this case, the FXO interface card) from the DNX chassis and replace it with another (in this case, the FXS interface card).
2. At the Node Summary Menu, place your cursor on Octal Voice and press **<Enter>.** The Voice Card Main Menu appears (see the following screen).
3. Place your cursor on the Configuration field and press **<Enter>.**



17-12. Voice Card Main Menu.

```
Eastern Research, Inc.    DNX - Octal Voice      Slot: 04   Help =
** Invalid Rear Card *
                        Octal Voice Card Configurat

Port# Name    Port Status    Port Type    Codec Mode  Rx Gain  Tx (
-------------------------------------------------------------------
01    Port01  In Service     Loop Start   mu-Law      0 dB     (
02    Port02  Out of Service Loop Start   mu-Law      0 dB     (
03    Port03  Out of Service Loop Start   mu-Law      0 dB     (
04    Port04  Out of Service Loop Start   mu-Law      0 dB     (
05    Port05  Out of Service Loop Start   mu-Law      0 dB     (
06    Port06  Out of Service Loop Start   mu-Law      0 dB     (
07    Port07  Out of Service Loop Start   mu-Law      0 dB     (
08    Port08  Out of Service Loop Start   mu-Law      0 dB     (

Configured Rear Card Type:Octal Voice FXS/PLAR Operation Mode:PCM 64
Actual Rear Card Type....:Invalid      Backplane Status: Off the
```

17-13. Voice Card Configuration Menu.

Procedure (cont.)

2. At the Configured Rear Card Type field press **<Enter>**.
3. Press **<Enter>** again, to scroll through the available options, which are:
   - E&M
   - FXO
   - **FXS (selected)**
4. Type **X** to save your selection. A screen message appears: “MESSAGE! Rear Card Type changed, RESET the card? Are you sure? (Y/N)?” Upon selecting **Y**es, another message appears: “ALERT! Please wait while the card prepares to reset! Press any key to continue”.
5. Upon pressing any key, the system returns to the Node Summary Menu. Place your cursor on Octal Voice and press **<Enter>**.

NOTE: The Octal Voice configuration files are stored on the System Manager Card. When an Octal Voice card is replaced, the old configuration is preserved.

CONFIGURING THE OCTAL VOICE MODULE PARAMETERS

Procedure

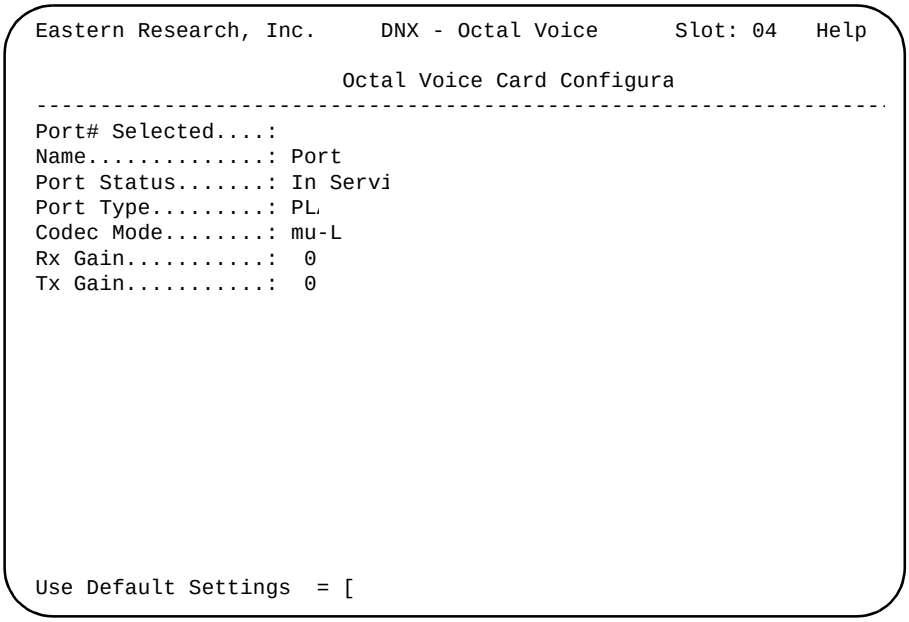
To configure the Octal Voice module's parameters:

1. From the Main Menu, select Node Summary.
2. Select a slot that has been configured for Octal Voice.
3. From the Voice Card Main Menu, select Configuration. Place your cursor on the Configuration field and press **<Enter>**. The following screen appears.

```
Eastern Research, Inc.    DNX - Octal Voice     Slot: 04   Help =

                        Octal Voice Card Configurat

Port# Name    Port Status      Port Type    Codec Mode  Rx Gain  Tx
-------------------------------------------------------------------
01    Port01  In Service       Loop Start     mu-Law       0 dB
02    Port02  Out of Service   Loop Start     mu-Law       0 dB
03    Port03  Out of Service   Loop Start     mu-Law       0 dB
04    Port04  Out of Service   Loop Start     mu-Law       0 dB
05    Port05  Out of Service   Loop Start     mu-Law       0 dB
06    Port06  Out of Service   Loop Start     mu-Law       0 dB
07    Port07  Out of Service   Loop Start     mu-Law       0 dB
08    Port08  Out of Service   Loop Start     mu-Law       0 dB

Configured Rear Card Type:Octal Voice FXS/PLAR Operation Mode:PCM 64
Actual Rear Card Type:Octal Voice FXS/PLAR  Backplane Status: On the
```

17-14. FXS Configuration Screen.

4. Place your cursor on the port you want to configure and press **<Enter>**. The following submenu appears.



17-15. FXS Configuration Submenu.

CONFIGURATION FIELD DESCRIPTIONS

Port #: The port to be configured.

Name: (text field) This is a user-defined field. Any name up to 11 characters in length can be entered to identify each port on the Octal Voice. Some users find it beneficial to use circuit numbers to name the ports.

Port Status: (option field) This field determines the status of the port. The status will either be *"In Service"* or *"Out Of Service"*.

Port Type: (option field) Depending upon the rear card type, the following port types are available under **FXS**:

- ***FXS Rear Card*** - the port type setting should be under the software control. Select from Loop Start, Ground Start, and PLAR type port configurations. The default port type setting should be the Loop Start. If the Rear Card Type is changed from FXS to FXO, all Port Types configured as PLAR should be changed to Loop Start considering FXO does not have a corresponding third port type selection.

Codec Mode: (option field) a coding algorithm. Select mu-law (default) for North American and Japan; A-Law for the rest of the world.

Rx Gain: (option field) adjusts the PCM receive signal gain from -6dB to +8dB.

Tx Gain: (option field) adjusts the PCM transmit signal gain from -6dB to +8dB.

Use Default Settings = [D] : (option field) press **D** to return your selections to the default settings.

Configured Rear Card Type and Actual Rear Card Type: Select and configure the rear card type to E&M, FXO, or FXS. If the configured type is different from the actual rear card type detected by the system, then *only* change the rear card type setting.

NOTE: If the configuration file is not present, the default setting for the rear card is FXO.

Operation Mode: The operation mode is PCM.

Backplane Status: A status that enables the card to communicate with the DNX Backplane.

OCTAL VOICE DIAGNOSTICS

Perform various diagnostics on a selected port out of eight available ports.

NOTE: The E&M, FXO, and FXS interface cards have the same diagnostics functionality. The following steps are applicable for all three interface cards.

Procedure

To run Diagnostics on the Octal Voice module:

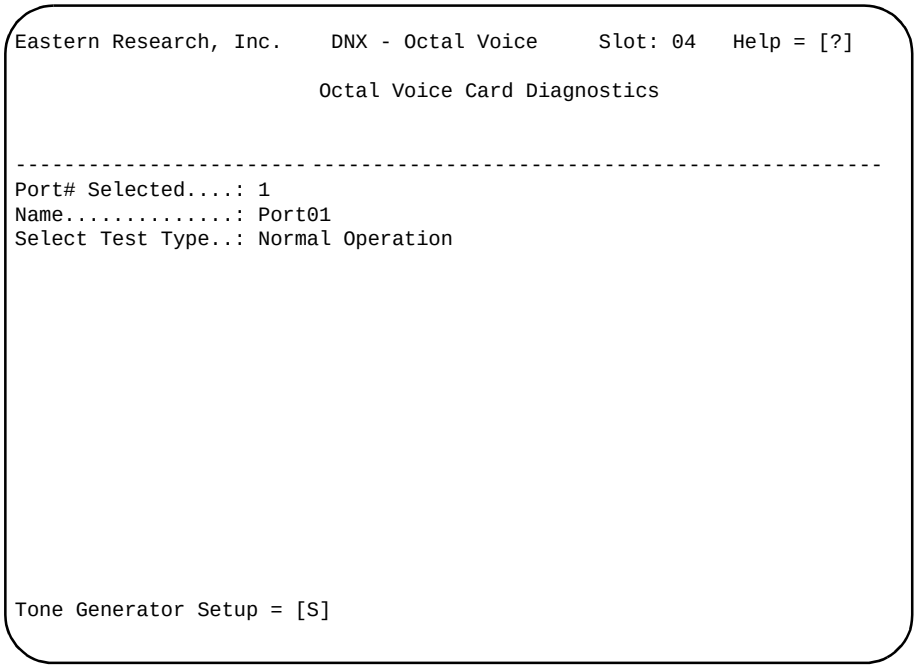
1. From the Main Menu, select Node Summary.
2. Select a slot that has been configured for Octal Voice.
3. From the Voice Card Main Menu, select Diagnostics. Place your cursor on the Diagnostics field and press **<Enter>**. The following screen appears.

```
Eastern Research, Inc.    DNX - Octal Voice      Slot: 04   Help = [?]

                          Octal Voice Card Diagnostics

Port#  Name     Test Type                     Port Status     Run Time
-------------------------------------------------------------------------
01     Port01   Normal Operation              In Service      471515
02     Port02   Normal Operation              In Service      471515
03     Port03   Normal Operation              In Service      471515
04     Port04   Normal Operation              In Service      471515
05     Port05   Normal Operation              In Service      471515
06     Port06   Normal Operation              In Service      471515
07     Port07   Normal Operation              In Service      471515
08     Port08   Normal Operation               In Service      471515



Current Backplane Status.................: On the Bus



Clear Run Time     = [R]
Clear All Counters = [A]
```

17-16. Diagnostics Menu.

4. Place your cursor on a port number and press **<Enter>**. The following screen appears.

NOTE: Only the ports that are "In Service" are accessible for diagnostics.


Eastern Research, Inc. DNX - Octal Voice Slot: 04 Help = [?]
Octal Voice Card Diagnostics
Port# Selected....: 1
Name.....: Port01
Select Test Type..: Normal Operation
Tone Generator Setup = [S]

17-17. Diagnostics Submenu.

OCTAL VOICE DIAGNOSTICS FIELD DESCRIPTIONS

Port #: The port number selected from the Diagnostics menu.

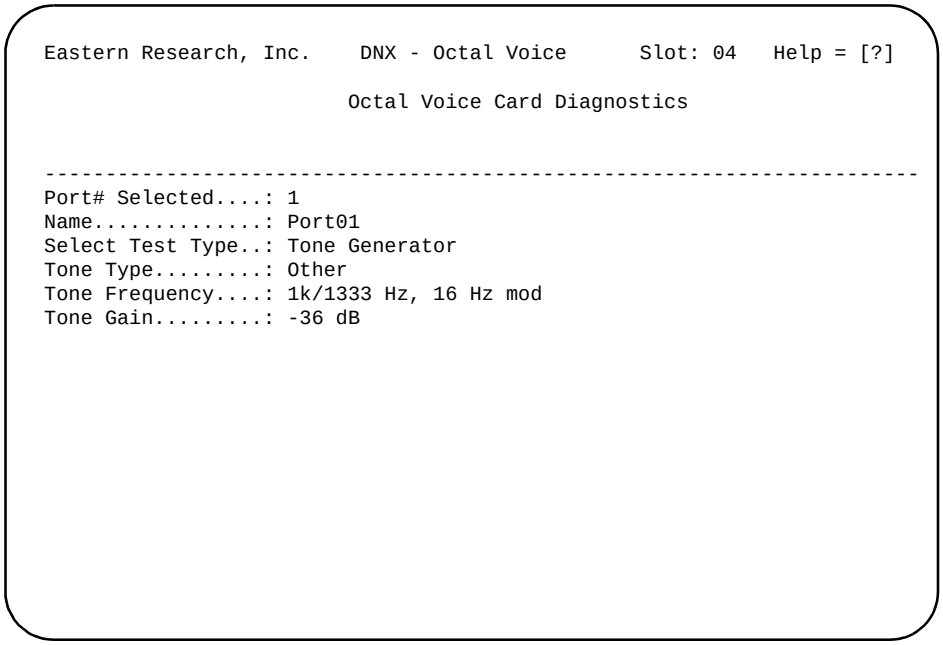
Name: The name given by the user at the Diagnostics menu.

Test Type: A host of tests can be run on a selected port; however, there should only be one Digital Loopback test active per voice card at a time. When the test type is set to Normal Operation, no other tests can run on that particular port.

To select a *Test Type*, place your cursor on the Test Type field and press **<Enter>** to scroll through the following available options:

- ***Normal Operation*** - 8 maximum configured tests per card. When the port is set to Normal Operation, no other tests should run on that port. This should be the default setting, at power up, for all ports.
- ***Digital Loopback*** - 1 configured test on any of the 8 channels. The channel mapping should be done before running this test. The test should be performed on the channel according to the channel mapping. The elapsed time since the test is enabled should be displayed and updated every one second.
- ***Analog Loopback*** - 8 maximum configured tests per card. The channel mapping should be done before performing this test. The test should be performed on the channel according to the channel mapping. The elapsed time since the test is enabled should be displayed and updated every one second.
- ***Backplane Loopback*** - 8 maximum configured tests per card. Put the channel in the backplane loopback by forcing the destination time slot to be the same as the source time slot.
- ***Backplane Loopback with Tx idle*** - 8 maximum configured tests per card.
- ***Transmit Idle Pattern*** - 8 maximum configured tests per card. There are no extra settings to do this test. However, you must enable the test. The elapsed time since the test is enabled should be displayed and updated every one second.
- ***Receive Idle Pattern*** - 8 maximum configured tests per card. There are no extra settings to do this test. However, you must enable the test. The elapsed time since the test is enabled should be displayed and updated every one second.
- ***Tone Generator*** - 8 maximum configured tests per card. When you select Tone Generator, this allows an adjustment of the receive gain control from -36dB to -6dB. You can select either DTMF tone or other tones. The DTMF tone frequency ranges from (697 Hz + 1209 Hz) to (941 hz + 1633 Hz). The other tone frequency ranges from (1k, 16 Hz mod) to (2100 Hz, single tone). Select from these tone frequencies during testing. The elapsed time since the test is enabled should be displayed and updated every one second.

NOTE: To setup or select Tone Generator, place your cursor on the Test Type field and scroll through the options until you reach Tone Generator. Press "S" and the following screen appears.


Eastern Research, Inc. DNX - Octal Voice Slot: 04 Help = [?]
Octal Voice Card Diagnostics
Port# Selected....: 1
Name.....: Port01
Select Test Type..: Tone Generator
Tone Type.....: Other
Tone Frequency....: 1k/1333 Hz, 16 Hz mod
Tone Gain.....: -36 dB

17-18. Tone Generator Submenu.

Upon entering the Tone Generator setup screen, all of the configurable fields display default values.

Port Status: (option field) This field determines the status of the port. The status will either be *"In Service"* or *"Out of Service"*.

Run Time: Displays a running time of the currently active port.

Current Backplane Status: An On-line/Off-line status that enables the card to communicate with the DNX Backplane.

Clear Run Time: Resets the run time of the currently active port back to zero.

Clear All Counters: Resets the values of all ports back to zero.

OCTAL VOICE UTILITIES

NOTE: The E&M, FXO, and FXS interface cards have the same utilities functionality. The following steps are applicable for all three interface cards.

Procedure

To access the Octal Voice Utilities, follow these steps:

1. From the Main Menu, select Node Summary.
2. Select a slot that has been configured for Octal Voice.
3. From the Voice Card Main Menu, select Utilities. Place your cursor on the Utilities field and press **<Enter>**. The following screen appears.

```
Eastern Research, Inc.     DNX - Octal Voice     Slot: 04   Help = [?]


                          Octal Voice Card Utilities

------------------------------------------------------------------------
                          Display Voice Signaling Status
                          Display Backplane Time Slots
                          Link Time Slot Profile Display
                          Monitor Backplane Status
                          Backplane Integrity
                          System Manager Interface
                          Reset Board
```

17-19. Utilities Menu.

Procedure

To access the Display Voice Signaling Status:

1. Place your cursor on the *Display Voice Signaling Status* field and press **<Enter>**. The following menu appears.

```
Eastern Research, Inc.   DNX - Octal Voice      Slot: 04   Help = [?]

                        Display Voice Signaling Status

                              'A' Status            'A' Transitions
Port#    Port Status       LOC        REM          LOC         REM
-------------------------------------------------------------  -----------
01       In Service        On Hook    On Hook      0           0
02       In Service        On Hook    On Hook      0           0
03       In Service        On Hook    On Hook      0           0
04       In Service        On Hook    On Hook      0           0
05       In Service        On Hook    On Hook      0           0
06       In Service        On Hook    On Hook      0           0
07       In Service        On Hook    On Hook      0           0
08       In Service        On Hook    On Hook      0           0


Backplane Status.......: On the Bus



Reset Transitions = [R]
```

17-20. Display Voice Signalling Status Menu.

The Display Voice Signalling Status screen shows the status of the **LOC**al and **REM**ote ends either *on hook* or *off hook.* The status should be displayed and refreshed in one second intervals.

To reset the on/off hook transition counts press **R**.

Procedure

To access the Display Backplane Time Slots:

1. Press **X** to return to the previous menu.

2. Place your cursor on the *Display Backplane Time Slots* field and press **<Enter>**. The following menu appears.

```
Eastern Research, Inc.   DNX - Octal Voice     Slot: 04   Help = [?]

                         Display Backplane Time Slots

Port#   To Bkpl TS  From Bkpl TS   DEN Status   DEN Verify   CEN Status
-------------------------------------------------------------------------
01      00000       00000          Disabled     Disabled     Disabled
02      00000       00000          Disabled     Disabled     Disabled
03      00000       00000          Disabled     Disabled     Disabled
04      00000       00000          Disabled     Disabled     Disabled
05      00000       00000          Disabled     Disabled     Disabled
06      00000       00000          Disabled     Disabled     Disabled
07      00000       00000          Disabled     Disabled     Disabled
08      00000       00000          Disabled     Disabled     Disabled
```

17-21. Display Backplane Time Slots Menu.

The Display Backplane Time Slots information for all eight voice ports are displayed.

DISPLAY BACKPLANE TIME SLOTS FIELD DESCRIPTIONS

Port #: The port number selected.

To Bkpl TS: Each port requires a single timeslot to communicate with the SMC. The number that appears in the *To Bkpl TS* column displays the actual timeslot if a connection was made. If a connection was not made then the timeslot will display all zeroes.

From Bkpl TS: Each port requires a single timeslot to communicate to the SMC. The number that appears in the *From Bkpl TS* column displays the actual timeslot if a connection was made. If a connection was not made then the timeslot will display all zeroes.

DEN Status: Data Enable Status

DEN Verify: Data Enable Verification

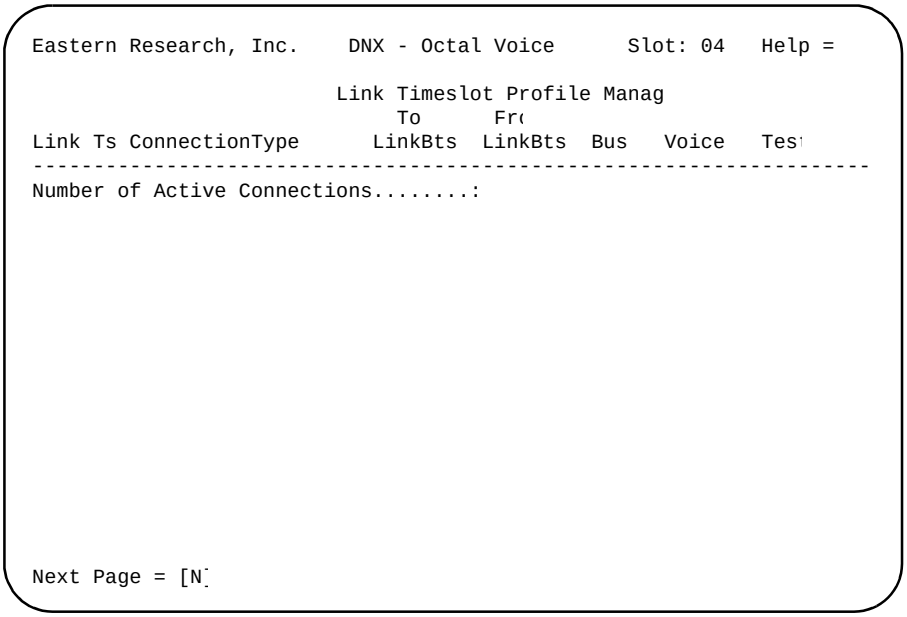
CEN Status: Control Enable Status

Procedure

To access the Link Time Slot Profile Display:

1. Press **X** to return to the previous menu.

2. Place your cursor on the *Link Time Slot Profile Display* field and press **<Enter>**. The following menu appears.


Eastern Research, Inc. DNX - Octal Voice Slot: 04 Help =
Link Timeslot Profile Manag
To Fr
Link Ts ConnectionType LinkBts LinkBts Bus Voice Tes
Number of Active Connections.....:
Next Page = [N

17-22. Link Time Slot Profile Manager Menu.

This menu displays the number of active connections on the link. Press **N** to view additional connections.

Procedure

To access the Monitor Backplane Status:

1. Press **X** to return to the previous menu.
2. Place your cursor on the *Monitor Backplane Status* field and press **<Enter>**. The following menu appears.

```
Eastern Research, Inc.     DNX - Octal Voice    Slot: 04   Help = [?]


                           Monitor Backplane Status
Description                                                  Transitions
-------------------------------------------------------------------------
Current Backplane Status.................: On the Bus

Card Service Status......................: In Service
System Ready To Go In Service............: Yes                1
System Clock Status......................: Present            0
Frame SYNC Signal Status.................: Present            0
Too Many Backplane Time Slots ON.........: No                 0
Receive TSFM Map.........................: Yes                2
Hardware Access to Memory................: No




Card In Service = [I]
Card Out Of Service = [O]
Reset Counters = [R]
```

17-23. Monitor Backplane Status screen.

MONITOR BACKPLANE STATUS FIELD DESCRIPTIONS

Current Backplane Status: On-line/Off-line status that enables the card to communicate with the DNX Backplane.

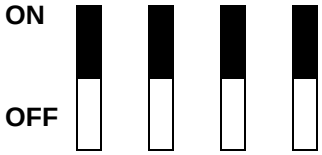
Card Service Status: Shows the status of the board.

System Ready To Go In Service: Shows whether the card is good or bad.

System Clock Status: A watchdog timer that monitors the integrity of the backplane clock. This clock is critical to backplane operation.

Frame SYNC Signal Status: A watchdog timer that monitors the integrity of the sync signal that coordinates data flow on the backplane. Critical to backplane operation.

NOTE: **Watch Dog Timer must be ON.**



Too Many Backplane Time Slots ON: A watchdog timer that monitors access to the backplane by this card. Protects the system from a faulty card corrupting data on the backplane.

Receive TSFM Map: Signals the hardware when to use the backplane.

Hardware Access to Memory: A way for the software to disable the memory for testing purposes.

The following hot keys invoke additional screens and/or functions:

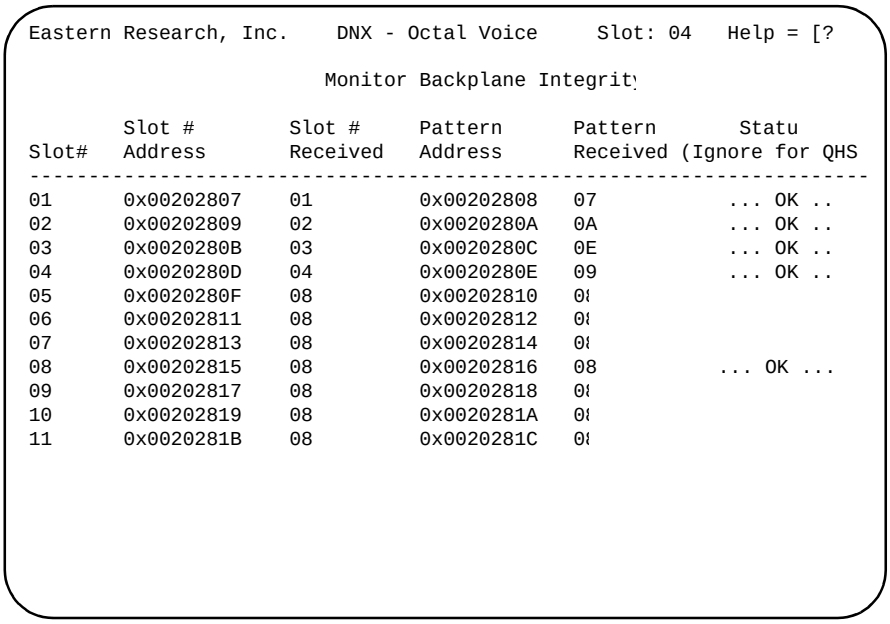
- Card In Service = **[I]**
- Card Out Of Service = **[O]**
- Reset Counters = **[R]**

Procedure

To access the Monitor Backplane Integrity:

1. Press **X** to return to the previous menu.

2. Place your cursor on the *Monitor Backplane Integrity* field and press **<Enter>**. The following menu appears.



17-24. Monitor Backplane Integrity screen.

This screen displays the backplane integrity of all slots to indicate if the card is on the buss or not.

Procedure

To access the System Manager Interface Status:

1. Press **X** to return to the previous menu.
2. Place your cursor on the *System Manager Interface Status* field and press **<Enter>**. The following menu appears.

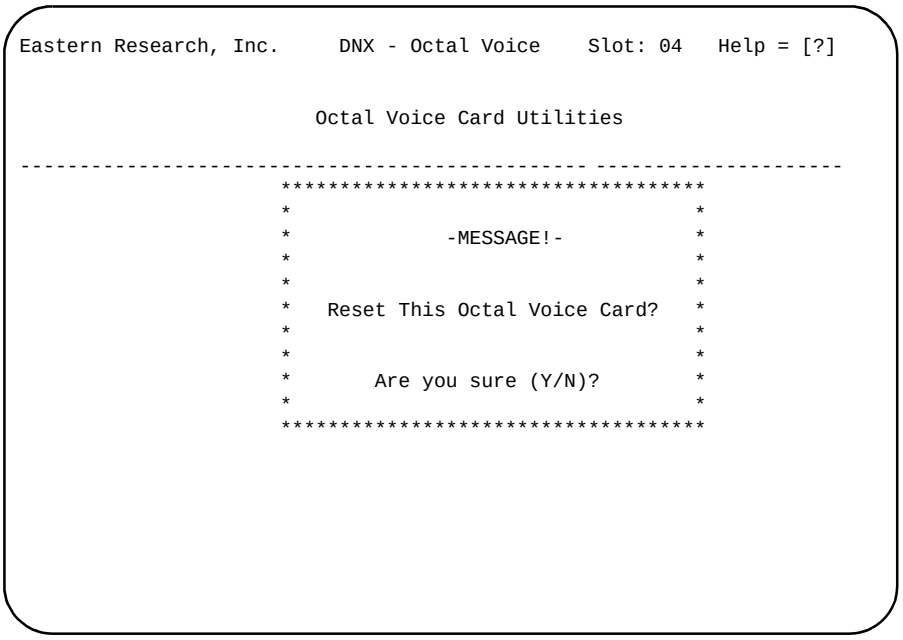
```
Eastern Research, Inc.     DNX - Octal Voice    Slot: 04   Help = [?]


                        System Manager Interface Status

------------------------------------------------------------------------
                  Configuration Map sequence number.......: 16
                  Downloaded Config Map sequence number...: 16
                  Configuration Map Checksum..............: 0
                  Configuration Map Byte Count............: 0
                  Number of Configuration Map changes.....: 4
                  Number of Configuration Maps downloads..: 2
                  System Manager Level Identifier.........: 600
                  System Manager Id.......................: 160
                  System Files sequence number............: 1
```

17-25. System Manager Interface Status screen.

This screen allows you to view System Manager Interface Statistics, such as map checksum or byte count.

Procedure **To access Reset Board:**

1. Press **X** to return to the previous menu.
2. Place your cursor on the *Reset Board* field and press **<Enter>**. The following menu appears.


Eastern Research, Inc. DNX - Octal Voice Slot: 04 Help = [?]
Octal Voice Card Utilities
-MESSAGE!-
Reset This Octal Voice Card?
Are you sure (Y/N)?

17-26. Reset Board screen.

Reset Board causes the card to initialize in the same manner as power up. During this boot up cycle, no user data will flow. Since the configuration resides on the SMC, connections will be restored.

Procedure **To Reset the Octal Voice Card, follow these steps:**

1. From the DNX Main Menu, select Node Summary menu.
2. Select a slot that has been configured for Octal Voice.
3. From the Voice Card Main Menu, select Utilities.
4. From the Octal Voice Card Utilities menu, select Reset Board.
5. A new message appears: “Reset This Octal Voice Card? Are you sure (Y/N)?” Press **Y** to reset, or **N** if you do not want to reset the device.

NOTE: **If you select N, and do not wish to reset the Octal Voice Board, the screen will return to the Octal Voice Utilities menu. Press X to return to the Voice Card Main Menu, and select About.**

OCTAL VOICE ABOUT MENU

The E&M, FXO, and FXS interface cards have similar identification information. The only difference is the Rear Card Type field displays the current installed interface card.

Procedure

To display identification information for the Octal Voice module:

1. From the Main Menu, select Node Summary.
2. Select a slot that has been configured for Octal Voice.
3. From the Voice Card Main Menu, select About. Place your cursor on the About field and press **<Enter>**. The following screen appears.

```
Eastern Research, Inc.     DNX - Octal Voice    Slot: 04   Hel



                            Octal Voice Card

-------------------------------------------------------------
Software Version.........: Voice
Software Release Date....: January 26,
Software Checksum........: E
Front Xilinx Version.....: voic
E&M Xilinx Version.......: EM
FXO-FXS Xilinx Version...: Tw
Front Card Type..........: Octal V
Front Card Revision......
Rear Card Type...........: Octal Voice
Rear Card Revision.......
```

17-27. Sample About Menu.

ABOUT FIELD DESCRIPTIONS

Version: This is the software version current in the Octal Voice's flash memory.

Release Date: The engineering release to production.

Checksum: The sum of all bytes in the Octal Voice card's flash memory at power up.

XILINX Version: The hardware version of downloadable, programmable devices.

Front Card Type: Displays the type of board in the system.

Front Card Rev: Displays the board's revision level.

Rear Card Type: Displays the type of board in the system.

Rear Card Rev: Displays the board's revision level.

Appendix A. Software Downloading

The details of downloading software vary from one operating system to the next. Refer to the documentation for your host computer when downloading DNX software.

TFTP APPLICATION

The DNX system supports TFTP (Trivial File Transfer Protocol).

1. On your host computer, find the file containing the new DNX software version. (The files will be in Binary format.)

2. Call up TFTP on your host.

3. Type in the DNX's host name under the target node field. (This will vary depending on the software package used on the host.)

4. Type in the file name and select "ASCII" or "text" under the file type field.

5. Select "OK" to start the software download. All DNX files will have the extension *.bin. If the DNX is on the local LAN, it will take approximately 30-40 seconds to download the software to the LAN port. The LAN port LEDs will flash while the software is being downloaded.

SMC Receives Its Own Update:

6. **(a)** When the SMC has received its own update file, and completed the update process, all LEDs will flash on the SMC. There will be a brief delay before the new code is burned into FLASH memory. The SMC will then re-boot itself. All LEDs will go out momentarily and then come back on as the unit recycles.

NOTE: When there are two SMC cards resident in the DNX system, the first SMC card is *on-line*, while the second SMC card is in *standby* mode. When the SMC receives its own update, the *on-line* SMC card will receive the update and then go *off-line* to reset itself; it will then resume in standby mode. Meanwhile, the second SMC card will go *on-line*. Repeat the procedure to update the new *on-line* SMC.

SMC Receives The Application Module Update:

6. **(b)** Follow steps 1 through 5, and then proceed to Download Devices Software via the Utilities menu.

In order to download software to a remotely located DNX system, IP routing must be enabled throughout your network. This also allows the use of SNMP, Telnet and PING to those remote DNX units

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Appendix B. Telnet Application

The DNX system supports Telnet. Telnet is a protocol that allows users to log on to remote hosts. It creates a Network Virtual Terminal (NVT) across the internetwork so that it appears as if the user is logged into the supervisory port directly.

1. Log in to the DNX system and navigate to the Port IP Addresses (Port Configuration) Menu. Enter the IP Address.

2. Start Telnet (connect to Telnet using the software on your host). Enter the host name of the DNX that you wish to connect to, and the IP address for the LAN port.

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